VOCABULARY ACQUISITION STRATEGIES AND VOCABULARY PERFORMANCE OF STUDENTS IN FOUR ALLIED HEALTH PROFESSIONS TRAINING PROGRAMS

BY

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Dedicated to the memory of

Professor Charles M. Bridges, Jr.

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Abstract of Dissertation Presented to the Graduate Council
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A STUDY OF VOCABULARY ACQUISITION STRATEGIES AND READING PERFORMANCE OF STUDENTS IN FOUR ALLIED HEALTH PROFESSIONS TRAINING PROGRAMS

By

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This is a description of vocabulary strategy performances by 72 students at four different levels of the Allied Health Professions training program. Performances of four groups of 18 students on seven sub-tests of vocabulary were correlated to predict mean scores on a related standardized vocabulary test.

A Stepwise Maximum R^2 Improvement regression equation computer program was tested to determine if models could be predicted for overall and individual groups. Resultant models were investigated by a two-way ANOVA. Row factors were quartiles of the standardized vocabulary scores; column factors were scores on the sub-tests by group. Seven two-way ANOVAs were conducted.

Models were found for the overall group and three of the four individual groups. Pairwise comparison techniques found that a model might be inferred for the lowest scoring group.

Sub-test scores were tested for reliability. The Pearson-r data and the Kuder-Richardson 20 and 21 formulas of internal interitem consistency were calculated. These tests, along with a small 38 student experiment determining the effect of the instructions accompanying each sub-test, contributed data of criterion validity on sub-tests for these four groups.

From these analyses it was concluded that the seven variables investigated: Context A (using synonyms only); Context B (adding sentences for each word); Memorization of word part information; Identification of word part information; Application of word part information; Generalization from word part information; and Dictionary were important in varying degrees as teaching tools for CETA and Job Corps. Dictionary, Identification, and Application of word part information appear to have the greatest promise of vocabulary strategy development for functioning in competition with two-year college and university students.

Further, the validation of the technique of the study itself rested in the fact that the model for the entire group, accounted for 70% of the vocabulary score variance. By-group models accounted for 52% for Job Corps, 64% for two-year college and 85% for university students, respectively. The Pearson-r correlation coefficients demonstrated for these groups vocabulary was associated with 95% of the variance in the total Reading Scores.

CHAPTER I

INTRODUCTION

Since the early 1960's, millions of federal, state and local dollars have been pumped into programs designed to enhance the employability of unskilled and underskilled Americans. At the same time, technology and information in every occupational area have proliferated at phenomenal rates. Training programs are too short to cover all but the most important areas.

Herber (1978) stated,

> . . . Basic concepts in any subject are communicated by words to which students must attribute special definitions and meanings. If students hold limited meanings for the words, they also will hold limited understandings of the concepts; hence, limited understandings of the subject. (p. 130)

Thus, even when students completing basic skills programs find entry level jobs, they need to continue their education just to keep up. This sequence is most prominent in the Allied Health Professions. Those aspiring to climb the career ladder find that basic skills are far from adequate. They almost immediately need to pass tests to enter the next level of training programs or take courses suggested by their employers. For most, this cycle results in their being locked into entry level positions or being replaced by more efficient electronic or mechanical devices. Once again, they find themselves underskilled and perhaps unemployable.

The assumptions behind the funding of training programs are that the communication skills can be taught in such a way that they become generative within the learners. The theory of generative learning is based upon theories such as that of Durrell (1966) who used the term "word power." The use of this term suggests the need for students to be able to analyze new words independently, and to be able to add to their reading vocabulary without aid from teachers or fellow students. All teaching rests upon the theory that it is possible to learn good habits or strategies. This theory is also true for learning of vocabulary acquisition strategies. The failure of educational basic skills programs may well relate to the selection of the strategies for vocabulary acquisition that were taught within those programs.

In a literature review of reading comprehension, Myers (1977) pointed out that most research investigations of teaching practices were based largely on tradition and convention. Petty et al. (1968), who reviewed the state of knowledge about the teaching of vocabulary, found that students in the occupational or career areas had not been included in any research study in the vocabulary teaching area. This study sought to fill that void.

In light of the criticisms of educational research the researcher sought to follow carefully established guidelines for conducting substantive research in education. Gates (1947) and Gage and Giaconia (1981) suggested a series of research sequences beginning with the descriptive case study research and then proceeding to studies of correlation employing several groups at different levels of advancement. Following the building of a corpus of information by these techniques,

they carefully structured experiments to establish valid practices for specific strata.

After a review of the existing literature, including unpublished studies, as indicated by Chapter II, the author designed this study to correlate vocabulary improvement strategies found in the descriptive literature (Herber, 1978; Boettcher, 1980; Brown, J.I. 1980) with a standardized vocabulary test. This procedure was suggested by Gates (1947) and Gage and Giaconia (1981). It was theorized by the researcher that test making procedures could validate teaching procedures or equally invalidate teaching procedures for the purpose of improvement of materials designed based upon theoretical constructs.

Statement of the Problem

It was the purpose of this study to investigate the effectiveness of seven specific strategies to teach vocabulary improvement. It is assumed by many that generative vocabulary development may result from proficiency in these skills. Herber (1978) defined generative vocabulary skills as those that allowed persons to expand their own vocabularies independently. For those in the career ladder training programs this means rapidly expanding reading as well as listening vocabularies. The usual methods of vocabulary instruction in technical areas are completely theoretically based rather than empirically derived. Only one study, Boettcher (1979), had been undertaken to examine those theories in any detail. Boettcher elicited self-report data from two adult readers in a reading improvement program. She asked them to describe the means they used to assign meaning to vocabulary in a difficult reading passage. Several months later she repeated the procedure with the same two

students, and she reported the changes in the strategies they selected. The results demonstrated that the better reader had five strategies at his disposal on the second testing, including Recall and Definition, where the less efficient reading student had only three strategies available. These strategies were paragraph restatement to seek definition, syntactic replacement of possible synonyms, and word part analysis. This reader never gained sufficient skill to attempt the recall or definition strategies. The results of this study indicated that there possibly was a hierarchical arrangement of vocabulary acquisition skills or strategies. If it were possible to ascertain which of those skills were productive for the better readers or vocabulary scorers on standardized tests, then vocabulary instructional programs could concentrate on these.

The current investigation examined the correlation between student scores on a set of vocabulary strategy diagnostic tests and performance on a standardized vocabulary test. And beyond that, a regression study was designed to predict the best model of the strategies as they contribute to students' scores on the vocabulary test.

In other words, this study attempted to find out which strategies were used most efficiently by high vocabulary scoring students and, conversely, which vocabulary strategies were and were not used efficiently by low vocabulary scoring students. The strategies used in this investigation were subskills from the "CPD" Diagnosis which was described in detail later in this chapter.

Study Design

The investigation was divided into three sections, the first a regression study, the second an Ex Post Facto study, reanalysis of the data, and the third section a validation of the test instrument, the "CPD" Diagnosis. These three sections were planned and executed to address the following objectives of the investigation. In addressing the objectives, specific questions were posed and specific hypotheses were developed, tested, and reported.

The purpose, as previously described for these procedures as designed, was to derive empirically those strategies of vocabulary acquisition that would be most associated with vocabulary growth for each group of participating students.

Regression Study
Objectives and Hypotheses

The objectives, questions and null hypotheses tested in the regression study (a study in which the data analyzed in the Ex Post Facto study were plotted on a linear prediction equation to predict the dependent vocabulary test (standardized test) scores for the participants) were

1) Objective: To investigate which is the best overall model of diagnostic strategies (sub-test measures) to predict the concomitant mean vocabulary test score.

Question: Which strategies, of the seven sub-test scores, compose the best overall model to predict the standarized vocabulary test scores of this study?

Ho: There is no best model of diagnostic strategies for overall prediction of the criterion vocabulary scores (the Nelson-Denny Reading Test, Vocabulary section) in this study.

2) Objective: To investigate which is the best model by group of diagnostic strategies to predict the standardized vocabulary test scores.

Question: Which strategies of the seven sub-test scores compose the best model by group to predict the standardized vocabulary test scores of the study?

Ho: There is no best model of diagnostic strategies for prediction of by-group scores on the criterion vocabulary measure.

The objectives, questions and null hypotheses tested in the Ex Post Facto study (a design in which data were collected, but in which no experimental manipulation took place) were

1) Objective: To investigate whether there is any interaction between educational group (Comprehensive Employment and Training Act, Job Corps, two-year college, and graduate program) and quartile within each group on a standardized vocabulary test in relation to performance on the seven sub-test variables of the diagnostic instrument.

Question: Is there an interaction between the scores on the standardized test for quartile and group for any of the seven sub-test variables?

Ho: For each of the seven vocabulary acquisition strategy variables comprising the diagnostic test there is no interaction between group membership and quartiles established on the standardized vocabulary test within each of the groups.

2) Objective: To investigate whether there are differences between the scores of four educational groups on seven sub-tests of vocabulary acquisition strategies for four separate educational groups.

Question: Are there differences among the four educational groups of adult students in the Allied Health Professions programs in performances on the seven sub-tests of vocabulary acquisition strategies and their performance on the standardized vocabulary test?

Ho: There are no significant differences between group performance on any of the seven sub-test vocabulary acquisition variables and their performance on a standardized reading vocabulary test.

3) Objective: To investigate whether there are differences between the scores on seven sub-tests of vocabulary acquisition strategies for the four quartiles within each educational group.

Question: Are there differences within the four quartiles of any educational groups?

Ho: There are no differences across groups for each of the four quartiles as measured by the standardized vocabulary test in this study as to their performance on the seven sub-tests of the "CPD" Diagnosis of vocabulary acquisition strategies.

Validation of Test and Instructions

Before undertaking the selection of sample populations and collecting data for the study, an experiment was undertaken to determine the validity of the instructions that accompanied the seven sub-test variables of the "CPD" Diagnosis. This experiment held objectives, questions and null hypotheses to test the validity of the instructions.

1) Objective: To investigate whether the instructions cued students as to what task they were to perform. The units of analysis were the intact classrooms of these four programs and no students were randomly assigned to any of the groups.

Limitations

The study was limited to the 72 students in four training programs in the Allied Health Professions classes of adult and post-secondary eduational programs. The four groups were selected by exit level of expected employment.

Therefore, the findings of this study will be generalizable only to post-secondary or post-public-school populations in the Allied Health Professions. In order for the study to be valid for other populations, data would have to be collected and the statistical programs describing this population repeated for those groups.

The second limitation of the study dealt with the nature of research questions and the structure of the population samples in order to attribute cause of one phenomenon to another. In other words, if this study were to claim that performance on any or all of the seven sub-tests of the "CPD" Diagnosis were the cause of the performance on the Nelson-Denny Reading Test vocabulary section, then the population samples would have had to have been randomly assigned before beginning the study, and further some intervention or manipulation would have had to be planned and conducted with two groups, one experimental and the other control. Since no experiment was planned, no causation may be attributed. The research procedures appropriate to this type of

descriptive study do allow for reporting the association between the sub-test variables and the Nelson-Denny vocabulary score.

The regression study supplied the amount of variance that was associated with the performance on any combination of variables and the vocabulary score for both the total group and the individual groups.

The third limitation of the study resulted from the use of a published commercially available diagnostic test. Although the measured strategies were those commonly mentioned by theorists such as Herber (1978) and O'Rourke (1974), they do not represent an exhaustive list of possible vocabulary acquisition strategies that might be available to adult students. For the purposes of determining a more exhaustive list, studies such as Boettcher (1979) must be conducted in greater depth than was possible here.

Assumptions

The assumptions basic to this study were as follows:

(1) All students aspiring to enter health professions courses at the post-secondary level of education (any program format and more than the seventh grade reading level) can provide sufficient responses to the two tests used in this study to achieve scores within the tests' ranges.

(2) All students included in the analysis of the data will take both tests.

(3) The two tests, the vocabulary section of the Nelson-Denny Reading Test and the CPD Diagnostic test are sufficiently related to serve as predictor and criterion variables for the study.

(4) That the Nelson-Denny Reading Test will be given in all cases prior to administration of the "CPD" Diagnostic Test (the Nelson-Denny serving as the criterion measure and the CPD Diagnostic Test serving as the predictor or dependent measure).

(5) That all students enrolled in Allied Health Professions Preparation programs will employ at least some of the strategies measured on the diagnostic test to assign meaning to unfamiliar vocabulary words.

(6) Any differences (between groups, between quartiles, or between group and quartile) will result only from the differences in use of the meaning assignment strategies as measured by the "CPD" Diagnostic Test.

Definition of Terms

To assist readers, several terms have been defined as they are used in this investigation.

Allied Health Professions. ". . . all health personnel working toward the common goal of providing the best possible services in patient care and health promotion" (National Commission on Allied Health Education, 1980, p. 14).

CETA (Comprehensive Employment and Training Act) Program. A federally funded program organized by a nonprofit corporation, preparing students to take jobs in Allied Health Professions at entry level requiring no more than a high school diploma.

CPD Diagnostic Test. The test developed to accompany the vocabulary building text, The CPD Approach Programmed Vocabulary third edition.

Generative vocabulary building strategies. Those strategies, plans, or heuristics, which allow individuals to expand their

vocabularies independently. These strategies focus on both the acquisition and expansion of word definitions and word meanings (Herber, 1978).

Metacognition. The general knowledge that guides effective selection and implementation of task-relevant skills (Brown, A.L. 1981; Flavell, 1977).

Job Corps. A federally funded program of residential centers containing employment related training components for young adult students from economically disadvantaged backgrounds. One of the employment components participating in this current study was preparing students to enter the Allied Health Professions at the less-than-high school diploma level.

Screening test. The Nelson-Denny Reading Test vocabulary section (the criterion measure in the analysis used in the study).

Vocabulary. Words and phrases that are used by writers to carry ideas, or concepts, as meaning to readers with whom they wish to communicate.

Vocabulary acquisition strategy. One of the seven defined strategies comprising the "CPD" Diagnosis as defined by Brown (1980).

Vocabulary development. Vocabulary development is the ability of a person to sort out his experiences and concepts in relation to words and phrases in the context of what he is reading (Goodman, 1970).

Vocabulary level. Quartile (as determined by SAS Univariate statistical analysis program) within each group on the Nelson-Denny Reading Test.

Need for the Study

Petty, Herrold, & Stoll (1968), in surveying several vocabulary investigations, found that very few produced any definitive information for students beyond the elementary grades. Further, these studies mostly measured how much better students instructed in some method of instruction scored on a standardized elementary grades.

Dale (1969) and O'Rourke (1974) attempted to apply scientific research principles from other sciences to the teaching of vocabulary. Dale asserted, that there was no science of vocabulary development. Thus, there are many materials and programs but no effective guidelines based upon research to help teachers use the most productive strategies with their students. In 1973, Dale established the first national word-difficulty inventory. Before then there were many lists of word counts taken from newspapers, magazines and textbooks, but no one had measured at which levels certain word forms became known; known, at least, sufficiently to respond accurately in both definition and form class to the word.

Gates (1947) and Gage and Giaconnia (1981) suggested validation procedures for teaching techniques be based upon validation procedures long used by test makers. These procedures began with constructs advanced by theory or observation, such as the Boettcher (1979) and then attempted to ascertain their productivity by correlating measures of these constructs with previously validated standardized tests. The validation procedures, of necessity, needed to be carried out using groups approximating those for whom the instructional practices were intended.

Only one such study, Boettcher (1979), was found. This was a set of self-report data for two students in a reading improvement program, sampled at two intervals one year apart. The second set of data was reports of responses to a set of questionnaires involving Navy personnel by Sticht (1976), Sticht, Fox, L.C., Hauke, R,N. and Zapf (1976), and Sticht (1977) who investigated reading as information-processing to determine new strategies for teaching reading skills. Their data were correlated with performance on The Nelson-Denny Reading Test. Their work was aimed at ascertaining the components of training in reading that would enhance those skills or strategies needed to function in complex reading tasks related to performance of jobs assigned to Navy personnel. As part of the investigations they sought to clarify the nature and demands of literacy in the workplace by observational case study techniques. They also examined the consequences of the ways in which students in Naval basic skills programs, which appear to be analagous to the Job Corps and CETA (Cooperative Employment and Training Act) programs in the Allied Health Professions. The principal finding of their investigations was that ". . . the amount of time job performers spend reading increased as a function of rank' (Sticht, Fox, Hauke, and Zapf, 1976, p. 14).

The results tended to confirm an earlier study, O'Connor (1948), who examined the vocabulary scores of 75 executives and reported that the measured English vocabularies of executives correlated with their salaries and responsibilities.

Procedures

Design

This study was comprised of four groups Job Corps, CETA (Comprehensive Employment and Training Act), two-year college nursing students, and a state university graduate health adminstrators training program. A four-by-four factorial design was constructed with the factor group and the factor quartiles determined by Univariate analysis of the vocabulary scores on the Nelson-Denny Reading Test using the SAS (Statistical Analysis System). The dependent variables were the seven subscale scores on the Diagnostic test.

Instrumentation

Two instruments, authored or coauthored by Brown (1973, 1980), were used to gather data for this investigation. The Nelson-Denny Reading Test served as the criterion measure. The quartiles of each group were determined on the basis of the Nelson-Denny Reading Test (Total) score and subsequently the vocabulary score of that test. The dependent measures were The "CPD" Diagnosis, tests which served as lesson placement devices for The "CPD" Approach Programmed Vocabulary third edition (Appendix A).

Prentice-Hall, Inc., had granted written permission for duplication of the "CPD" Diagnosis and for the alteration of the instructions for use with the validation part of the study. The detailed procedures for the validation study were discussed in Chapter III.

The "CPD" Diagnosis consists of a set of seven sub-tests: Context (CA) and Context (CB), Parts, Memorization, Indentification, Application,

Generalization, and Dictionary. Context consists of a set of ten words accompanied by five distractors each. Context consists of the same ten words; however, they are enclosed in sentence contexts. The strategy of using context clues is defined by Brown (1980) as ". . . the context, not the dictionary, is needed . . . vocabulary in context . . . contributes more to reading comprehension than any other factor, more even than intelligence" (p. 23).

Parts are divided into information-processing categories: Memorization, Identification, Application and Generalization. Memorization measured the students' knowledge of rules about word parts. Identification measured the ability to distinguish form of a prefix or root within a real word. Application measured the ability to assign meaning to a word on the basis of its word parts. Generalization measured the ability to apply word part knowledge to diverse situations, assigning meaning through decoding with Latin roots and prefixes determined by examining five words containing that root or prefix.

The final portion of the diagnostic test measured the students' ability to employ appropriate dictionary entries to locate information about words and word parts.

The criterion measure was the Nelson-Denny Reading Test Vocabulary score (Form C or D). The lack of sufficient tests of Form C, when testing some of the large groups who only took the Nelson-Denny Reading Test, made the use of Form D, as a supplement necessary. The Nelson-Denny Reading Test was designed for grades 9-16 and requires approximately 30 minutes to administer. For the graduate program in the

sample, a set of cut-time norms were supplied by the instructional manual (Brown, J.I., 1973). Self-scoring answer sheets were purchased from Houghton Mifflin to use with the Nelson-Denny Reading Test. The "CPD" Diagnosis is printed inside of a text, Programmed Vocabulary the CPD Approach. And since the tests were used for multiple groups administrations, the researcher designed an answer sheet for student use.

Data Collection

The data for the principal study were collected by the researcher at the site of each program that participated in the study in May, June and July of 1981. All of the administrations were group administrations. The original study as proposed, projected testing 20 students at each of four sites: a CETA program preparing students for entry level jobs in some area of Allied Health, a Job Corps program preparing students for entry level jobs in some area of Allied Health, a two-year college nursing program whose nursing students would become Registered Nurses in a three-year period, one year for college course work followed by two years of nursing education and hospital participation, and a four-year or graduate program training health related professions administrators. Because of the problems of some students not being present for both administrations, one program meeting in a four-hour block of time once weekly (the health administrators), the data were collected in several different ways. However, the tests were all administered by the researcher, and the timing on the Nelson-Denny Reading Test was strictly adhered to. The "CPD" Diagnosis was an untimed test, and in the principal study all students had as much time as they needed to complete the test. All of the students whose tests

were included in the analysis took the Nelson-Denny Reading Test before taking the "CPD" Diagnosis. The complete description of the data collections was included in Chapter III.

Data Analysis

Appropriate statistical tests were planned for each of the hypotheses in the principal study. These were based on the results of the correlational information developed for the principal study, and the reliability and validity data. Specific procedures for the detailed analysis were outlined more carefully in Chapter III and the results were reported in Chapter IV. The conclusions and implications that logically could be drawn from the results were reported in Chapter V.

Summary

While the value of successfully trained generative learners in any technical field is self evident, research is not helpful in spelling out the how or why of that training. The need for constant retraining in the Allied Health Professions requires that every member of the profession, no matter how elementary the level, be able to learn from printed matter in large volume.

The current study investigated the relationship between scores on seven sub-tests measuring vocabulary acquisition strategies and student performance on a standardized vocabulary test. The sample populations were made up of participants in programs along different points of a career ladder. The investigation was designed to collect information about the strategies used by high, medium and low vocabulary scorers.

The theory behind dividing the groups into performance quartiles, as measured by the standardized vocabulary test, was that smaller segments (quartiles of the sample groups) would better describe the behavior of adult students than the total group or even the separate career ladder segment groups. Adult groups, as evidenced by the diversity of scores in this study (Table 2; Appendix Table C-1) rarely appear homogenous in nature. Examination of the quartile placement within each group was designed to provide information about the strategies that would yield greatest benefit for training generative vocabulary learners at the most elementary entry levels of the technical disciplines.

The data and subsequent conclusions and implications derived from those data were intended to suggest strategies for time effective experiments on vocabulary development for adult students who have much information to learn in addition to skills training.

CHAPTER II

REVIEW OF LITERATURE

Rationale for Investigating Function of a Subset of Vocabulary Acquisition Strategies Commonly Taught to Adult Students as They Predict Reading Proficiency Scores

The building of a theory of vocabulary acquisition for adult students enrolled in basic education programs is long overdue. The absence of such a theory may have resulted from an absence of adequate theory about the nature of literacy and its consequences (Olson, 1976). Such a theory should include knowledge about the competencies developed by literates as contrasted with that of illiterates or marginally literate persons. Sticht (1977) holds that the role of literacy in various sociopolitical/economic/domestic/personal activites needs clarification. Such clarification, he stated, was essential to the development of the types of social programs which aim at ". . . obtaining basic social and economic parity among groups and individuals in the society. It involves the simultaneous assessment of the critical demands made by society on the literacy skills of individuals and the development of tools to determine individual competence in these skills" (Miller, 1973, 375).

Among other questions involved with comprehending at work, Miller asked,

> Do people know about and use special information-processing skills for searching and locating

> information in reading materials? Do they use specific skills for storage and retrieval of information in reading tasks which have the learning of information as their goal? Such information provides insights into the role of literacy in job performance, including learning in job skill training programs. (Miller, 1973, p. 4)

Sticht, Fox, Hauke, and Zapf (1976) reported that Navy personnel most frequently read signs, schedules, and notices. This is also the material most frequently read by the general population at work (Sharon, 1972). The Navy personnel read for an average of two hours a day, and reading time was directly related to reading skill level for Navy students and job performers. Finally, the amount of job performers' reading time increased as a function of rank. Thus, the fact that higher positions demanded more use of reading skills was a point of considerable importance for "upward mobility" programs for less-educated citizens.

These data tend to confirm the findings by Johnson O'Connor (1948). The Human Engineering Laboratory and Johnson O'Connor Foundation tested 300 high-school freshmen, 700 college freshmen and 1,000 college graduates, college professors and major executives. (Major executives were those that have held either presidencies or vice-presidencies of business organizations for a ten-year period.) From a carefully designed set of one hundred fifty words supplied with five distractors (the words were enclosed in a short phrase context) the average error rate per population group was high-school freshmen, 76 errors; college freshmen, 42 errors; college graduates, 27 errors; college professors, 8 errors; and the executive group, 7 errors. These results were replicated in different forms by comparing other samples taken from similar groups.

In an essay on Vocabulary in Writing for Business, Six Propositions for Pedagogical Use, Gallagher (1979) examined developmental and functional constraints placed upon vocabulary as signals of concept interface with others in the same business community. He posits the "Six Propositions" as ". . . intended, quite calculatingly, to help make a degree of power more accesible to those business writing students who will soon pass on to the lower positions in the business hierarchy" (p. 42).

Shaughnessy (1977,211) has observed that, "The intermediate writer's vocabulary may give him a wider range of words to choose from than the basic writer has. But it does not guarantee 'better choices'" (211). In view of Gallagher's constraints, research into the acreation of vocabulary in content or vocational areas is more than necessary. It is mandatory.

On the acquisition of reading and literacy, Sticht (1977) suggested that literacy in the workplace involves two types of reading. First, learning to read in a specialized area may involve learning an alternative representation system for the spoken language. Second, reading is central in the development of literacy in the use of written language so that complex problem solving may take place. Sticht found that two features underlying the use of printed materials in the reading-to-do tasks observed with Navy personnel are permanence and capacity for being arrayed spatially. These aids were used both in texts and figures as consultative aids to performance. The permanent nature of print relieves the burden of having to store information in memory. The use of figures draws upon the fact that the printed word can be distributed over a

spatial area so that components can be labeled and hence identified in course of performing a task.

The learning strategies, too, draw upon the permanence of print, as indicated by the frequent use of study skills. In general, the use of study skills has been established so that the material can be examined at length and be exactly analyzed. The results of the study of the relationship between "general" reading ability and reading of classification tables, flow charts and diagrams from narrative prose suggests that the ability to perform complex analyses needed to comprehend materials in the workplace develops concurrently with "general" reading skills. Perhaps this ability reflects basic changes in cognitive processing, due to study of the printed language which, in turn, contributes to "general" literacy.

Marshall and Glock (197879) reported a study designed to investigate the actual process of comprehension. The study was designed to determine the effects of varying the dependency and relative structures of text and measuring these variations upon the structure and content of written recall of 160 subjects. The subjects were drawn from a community college population with an open admissions format and an Ivy League college with stringent admissions test requirements. She found that the averages for the two groups of students differed significantly. The community college students on the average recalled 23.4 percent of the possible items while the four-year students recalled an average of 52.6 percent of the possible items. Further, the four-year students' recalls were affected by the textual manipulations only when the dependency structures (if-then) were missing from the discourse. The two-year college students produced recalls that were not in connected

discourse (a linguistic term used to define any utterance, regardless of length, that is a complete unit of meaning and has cohesion or unity) Halliday and Hasan (1976). The four-year college students produced recalls that were true connected discourse. Finally, there was considerably less variability in the recall scores of the four-year college subjects.

Marshall concluded that there were quantitative differences in information processing capabilities of the two populations. It suggests possibilities for the development of problem-solving strategies with the two-year college students that are used by the four-year students, also found by A.L. Brown (1981) to be a successful teaching format. The novice-expert phenomenon has come into focus for researchers dealing with the psychology of learning for students at colleges and universities. If the strategies that produce productive instructional changes for college students could be brought to bear on the appropriate vocational training areas' programs, then perhaps the millions of dollars spent on programs for the unemployed and undereducated would become generatively productive. The persons who emerge from programs that implement appropriate research-based learning strategies would be able to function at an entry level job while continuing to advance through testing programs into higher level training programs. The nurses' aid trained at Job Corps would be able to develop such concepts and skills to test into the LPN (Licensed Practical Nurse) training program at the local two-year college or vocational technical school. The LPN would be able to develop sufficient skills to enter the Registered Nurse or Allied Health programs at the next level. Thus, in a specialty or discipline where testing success governs admission, the need to

develop generative strategies in job related problem solving and concepts is the only way to gain advancement and greater monetary reward.

Sticht (1977) suggests that improving reading is not enough for technical job literacy. He suggests that two strands of learning--knowledge and decoding--must be improved. These strands are analogous to those suggested in Larkin, Heller and Greeno (1980) and Larkin (1980). Comprehension and the role of vocabulary and concept development during instruction are coming together in the associated disciplines to develop a theory of problem-solving to encompass a broader range of concepts. In part, these changes have been influenced by considerations of problem-solving in specific subject matter domains. Because solution of complex problems generally requires knowledge of the world, the amount, accuracy and organization of an individual's knowledge must influence the effectiveness of problem-solving efforts. Regardless of the sophistication of a problem-solver's procedural and strategic knowledge, deficiencies in knowledge of facts, concepts, and principles constrain the scope of that individual's problem-solving ability. The organization of knowledge also influences a problem-solver's efficiency. The functioning of planning processes in skilled scientific problem-solving is a prime example of this phenomenon: the ability of solution methods comprised of principles stored in coherent related clusters facilitates finding optimal solution procedures. These investigators conclude that procedural knowledge cannot be considered in isolation from the knowledge structures on which processes must operate.

The Value of Teaching Heuristics

Efforts to identify characteristics of highly skilled problem-solvers have revealed the importance of representational processes in problem-solving. Rather than merely demonstrating that experts are proficient means-end analysts, for example, these studies of proficient problem-solvers rely upon qualitatively elaborated problem representations that distinguish them from novices in the discipline. In effect, experts understood problem situations better than novices, and it is this understanding that created effective and efficient solutions. Several courses have been instituted at colleges to teach procedural knowledge to students who are failing comprehensive examinations. The classic studies followed courses developed by Bloom and Broder (1950) at the University of Chicago. Schoenfeld (1978) developed a course for university-level students majoring in mathematics designed to teach them "heuristics," techniques for selecting a promising approach from the various mathematical techniques they already know. His instructional technique was to specify heuristics corresponding to various aspects of the problem-solving process (analysis, exploration, verification). Heuristics for analysis of a problem include drawing a diagram, examining special cases, and trying to simplify the problem.

Bloom and Broder worked with undergraduates who had failed the university's comprehensive examination, which required solving problems using knowledge integrated from several years of study. Their instructional technique was to have a student solve a problem, while thinking aloud and being observed by a second student. Then the two students looked at a written solution produced by a skilled solver who also

thought aloud while solving the same problem. The two students then worked together to try to identify similarities and differences between the process of the student solver and that of the skilled solver. The course was a success in that student scores increased from .74 to 1.43 on a 4-point scale.

Brown, A.L. (1981) in a remedial study skills course at the University of Illinois was able to assist less successful students to identify the differences between their study skills heuristics and those of successful students and to assist them in abandoning less productive study skills for more productive strategies. Her results corroborated those of Bloom and Broder (1950) and Schoenfeld (1978).

Which Instructional Method for Whom

Snow and Peterson (1980) summarizing research comparing two differing methods given to different groups of students in college courses by averaging the examination scores obtained in each method which yielded "less than striking results." Dubin and Taveggia (1968) reported no consensus after examining comparisons of lecture versus discussion methods of college teaching studies: 45 studies showed an advantage using one method, 43 studies favored the other. Schramm (1962) summarized the results of studies comparing televised with live teaching and found that 83 favored television, 55 favored live teaching and 255 showed no difference.

Examination of this type of research with high school and college students poses a new question: "Which instructional method is best for whom?" Petty, Herrold and Stoll (1968) summarizing research about the knowledge of the teaching of vocabulary achieved results similar to

those of Snow and Peterson. However, Dale (1969), in stating that there was no science of vocabulary building, stated a need for building these data into a research-based theory of vocabulary building.

The one positive finding in Petty, Herrold and Stoll (1968) was that a body of evidence was accumulating to dissemble the widely held notion that having students read, read, read was a satisfactory method for teaching vocabulary. Further, they noted that J.I. Brown suggested a programmed approach to vocabulary development as the approach yielding the best results (as measured by standardized test) for good readers enrolled in a midwestern university. This research resulted in the diagnostic test used in the current investigation. Kurth (1979) found that with remedial two-year college students vocabulary growth was facilitated better by direct instruction and group discussion as opposed to individualized work with programmed materials.

The research is analogous to that found by Johnson and Ruskin (1971) concerning the learning gains made by students working under the Keller Plan--a format wherein students worked independently at their own pace and appear for unit tests when ready before proceeding to the next unit. Unfortunately, the Keller Plan courses do not reduce the differential in achievement between lower and higher ability students as compared with conventional instruction. These courses also often show dropout rates equal to or greater than dropout rates sustained for other forms of instruction (Kulik, Kulik, and Cohen, 1979).

Studies reviewed by Snow and Peterson (1980) on Aptitude-Treatment Interaction (ATI) included components of general intelligence, fluid-analytic ability and the ability of students in respect to their

cognitive style differences. Cattell (1971) and Horn (1976) have investigated differences in field-differentiation or ability to relate to performance on novel learning and problem-solving tasks through these abstract reasoning tests and embedded geometric pattern in a larger complex field. Students who are able to dissembed the geometric pattern from the surrounding field and thus obtain high scores on such a task are termed field-independent. Those unable to do this obtain low scores and are thus called field-dependent persons. Short-term memory ability, anxiety, achievement via conformance versus achievement via independence, locus of control, and preference for instructional method, all impacted on the Aptitude-Treatment-Interaction scores of students. But, since the amount of testing for students in CETA and Job Corps vocational programs must be kept at a minimum because of the dropout rates for these students, methods of assessing learning and methods of skill development that provide information and instant feedback in terms of establishment of motivation must be devised. Learning tasks for many of these students have proved overwhelming in the past. Seeking the most efficient procedures for these students have reduced the basic skills introductory components of all of the programs to instruction in vocabulary. Langer (1967) suggested that vocabulary had a direct and essential relationship to concepts and that difficulty in reading comprehension stems from difficulty associating written symbols with the concepts they represent. Consistently, knowledge of word meanings has been isolated as the major contributor to reading comprehension. Studies by Nacke (1970) and Thorndike (1917) suggest that words within

a single passage vary in their "potency" and that prior to measuring knowledge of a concept readers had to identify that concept. A group of twelve teachers who were enrolled in a graduate reading course were given the task of identifying those words essential to an understanding of the selected reading passage. The results were positive for convergent validity of the construct. It would have had more merit if content teachers had participated in the process of associating words with concepts, since Herber (1978, p. 132) states that the "content teacher's responsibility usually is to help students learn the meanings of words so that they will develop an understanding of the subject." He further states that vocabulary-development skills are those which allow persons to expand their own vocabularies independently. These skills focus on both the acquisition and expansion of word definitions and word meanings. Some of the vocabulary acquisition skills listed by Herber were evaluated in the current investigation, use of word parts (roots, prefixes, suffixes), use of the dictionary, and use of context (Herber, 1978, pp. 129172).

How do students know when and how to use these skills or strategies to solve problems, remember a series of words or select some attributes of words, sentences, paragraphs, and ignore others to respond to the task at hand in reading or in the testing setting most commonly the end for which they engage in reading to learn? Further, the question remains, "How does one determine which information searching strategies to apply to obtain the information that will appropriately satisfy either of these requirements?" Beyond that, the final groups of questions for those who are intent on building programs to develop skills or strategies for improvement of reading or writing vocabulary rests

with the ability to determine and validate those factors or strategies that will produce adequate or significant experimental results.

Metacognition

Building a model of human thought and learning processes has occupied both philosophers and teachers since instruction with the printed word began. Being able to read and comprehend what one reads includes assigning meaning to vocabulary. Knowing how students in various stages of development assign meaning would seem to be a worthwhile effort. Of itself, however, it has limited value. Knowing how students at different levels of training programs process information about vocabulary adds the advantage of the selection process. One must first, it seems, understand what, if any, process is enacted by the test instructions, materials structures or organizational pattern that is recognizable by readers along a progression from less able to more able. Or as A.L. Brown (1981) posits the problem of metacognition, "knowing when, where, and how to remember." Myers and Paris (1978, p. 680), in a study of the metacognitive knowledge of children's reading, explain metacognition or metacognitive knowledge as a "higher" level of thinking about task-specific strategies constituting a transituational information system about the parameters of learning and performance. Metacognitive knowledge, as identified by Flavell (1977), serves as an executive function of coordinating and directing the learner's thinking behavior. Flavell and Wellman (1977) identified person, task and strategy variables as three important categories of metacognitive knowledge that might help a child to remember effectively.

They felt learners or memorizers needed first to appraise realistically their potential in order to engage in skills commensurate with their ability. Second, learners need to know about the purposes, scope and requirements of the task before the problem can be efficiently attacked. Third, learners needed to be aware of the existence of relevant strategies and to recognize the need to apply them. Learners must also form plans or generate hypotheses, check feedback for progress, evaluate results and generalize behavior. Brown (1979) and Flavell (1977) point out that this aspect of development does not develop as early as other cognitive structures and that children younger than eight years of age seem less sensitive to the existence of metacognitive knowledge. It may be a critical link in explaining the transition from a novice to a sophisticated problem solver able to assign meaning to vocabulary in complex materials.

Anglin (1970) borrowing a technique from Bower et al. (1969) to ascertain if organizational patterns impact on memory tasks. Using four groups of subjects, in grades 3-5, 6-8, 11-12, and a group of undergraduate and graduate students, he offered 20 words organized by form class (nouns, verbs, adjectives, and prepositions). The form class organization was then arrayed as ends of branches--one form branching right and another left. The other two patterns maintained the right and left branching but were scrambled as to form class.

Within each subgroup subjects were haphazardly divided into four subgroups with three males and six females each. Each subject was handed a five-page booklet, asked to turn to the third page and find four tree-like diagrams with words at the ends of the branches. A tree diagram was drawn on the blackboard to demonstrate what was meant.

The subjects' task was to memorize as many of the words as possible. Specifically, they were to try to remember exactly where on the diagram the words appeared, and which words appeared next to each other. When they had completed the study period (90 seconds), they were presented with another page with the same tree diagrams with the words at the bottom of the page. Their task was to write the words in the exact place they had occurred on the study sheet. Their word replacement time was not structured.

Following the performance of the tasks, Anglin concluded that when adults are presented material that is organized spatially to conform to the categorical and hierarchical relations among words, their recall reflects an apparent appreciation of these relationships. The performance of children reflects such appreciation loss. The relations which adults seem sensitive to might be described in terms of shared features. The adults could complete 90% of the structured adjacent word-pairs when opposites were included, but only 30% of the scrambled presentations; children in grades 3-4 (35% structured, 30% scrambled), grades 7-8 (70% structured, 45% scrambled), grades 11-12 (80% structured and 55% scrambled).

It would thus appear that spatial and form class relationships may signal the type of performance required of a task. In order to determine how important instructions might appear to be in carrying out a task designed to measure efficiently with the various strategies sampled by the diagnostic test used in this current investigation, a task was structured with a group of twelfth grade high school students reading beyond the tenth grade level. They were divided haphazardly into four groups. Each group was administered the test with only the instructions

being altered. The first set were the intact instructions accompanying the test (visual display). The second set was the visual display plus a taped reading of the instructions to accompany the performance of the tasks. The third set was a revised set of instructions, naming the task and telling the students to continue with the next task (visual display). The fourth set was the same as the third but accompanied by a reading of the original instructions (Appendix B). The findings demonstrated that the instructions as written (providing self-pacing) proved significantly different from an overall MANOVA analysis with words enclosed in sentence contexts, generalization of word parts, and use of dictionary displaying individual significance. This indicated that at least for twelfth grade students reading above the tenth grade level instructions were necessary to have them establish plans and search strategies necessary to complete these three tasks.

The Developmental Word Studies

When we use a word to denote an object in the world of sense we do so by ignoring certain properties and paying attention to others (Locke, 1690).

As we approach an investigation into the vocabulary acquisition strategies for groups of subjects along a career ladder, we are mindful that subjects will be functioning at different stages of cognitive development. It is logical in terms of addressing future pedagogy to ask the question, "Does the individual's appreciation of verbal relations become more abstract as he grows?"

The validity of the generalization hypothesis was sponsored by Locke (1690).

> There is nothing more evident, than the idea of . . . children are . . . only particular. . . . Afterwards when time and a larger acquaintance have made them observe that there are a great many other things in the world, that in some common agreements of shape and several other qualities, resemble their father and mother, and those persons they have been used to, they frame an idea, which they find those many particulars do partake in: and to that they give others the name 'man,' for example. And thus, they come to have a general name and a general idea. . . . By the same way that they come by the general name and idea of 'man' they easily advance to more general names and notions. For observing that several things that differ from their idea of man, and cannot therefore be comprehended under that name, have yet certain qualities wherein they agree with man, by retaining only those qualities and, uniting them into one idea, they have again another and more general idea . . . comprehended under the name 'animal' . . . by the same way the mind proceeds to 'body,' 'substance,' and at last to 'being,' 'thing' and such universal terms, which stand for any of our ideas whatsoever. (Locke, 1690, Book III)

Anglin (1970) sought to confirm this process, as hypothesized by Locke, in a series of four investigations. He selected words from appropriate lists that would be accessible to children in the third and fourth grades. Replicating work done by Miller (1967) and elaborating on it, he selected six nouns, five verbs, five adjectives and four prepositions. Then he assembled several groups of subjects with 20 males and 20 females for the first sorting experiment, 12 males and 12 females in each of four groups for the second sorting experiment, four groups of ten males and ten females for a free recall experiment, and finally, four groups of 25 males and 25 females for a free association experiment.

The groups consisted of samples from third and fourth grades, seventh and eighth grades, eleventh and twelfth grades and adults from various four-year colleges in the northeast (some of the adults were graduate students).

The conclusion of all of the experiments tended to document that human language functions develop progressively from concrete to abstract. However, the most significant finding, according to Anglin, was that this progression occurs far more slowly than anyone suspected documenting the fact that vocabulary acquisition progresses in development far into adulthood, certainly through college ages (18-35). Adults appear to be able to generate a myriad of equivalence relations which for them make two words similar. By and large adults could retrieve the hierarchical structure that had been built in to word list. Opposites had the highest rate in all of the tasks. Children, however, rarely classified the words in form class units. Children from grades 3-4 and grades 7-8 cannot sort 20 simple words into the four parts of speech even though the writer assumed that the notion of form class is taught in English lessons from grade two on; older children and adults did better but were unable to sort by form class entirely.

To discover the strategies that fluent readers use to assign meaning to difficult or unknown words in context, Boettcher (1979) developed case study data for two skilled readers at different points along the college career range. She selected 11 paragraphs from William F. Buckley, Jr.'s, spy novel, Saving the Queen. Each paragraph was selected for containing one of 11 difficult words as judged by two independent judges. The subjects talked aloud and were recorded on tape so that the strategies each of them used could be determined. The less able reader,

confirming the Anglin data, used such strategies as paragraph restatement (basically avoiding defining the word), syntactic analysis and visual or auditory word part analysis. The more able reader displayed a wider variety of strategies but he, too, used paragraph restatement 27% of the time, syntact analysis 18% of the time, word parts 9%, recall 9% and definition 36%. After one year of vocabulary development in a reading program, the first reader had shifted strategies from paragraph restatement (55%-18%), syntactic (18%-27%) and word part analysis (27%-64%). The second reader also shifted his strategies considerably using a wider range of strategies; paragraph restatement (27%-0%), syntactic (18%-18%), word parts (9%-0%), recall (9%-18%) and definition (36%-64%). In her conclusions, Boettcher advanced the hypothesis of steps along a degree of knowledge scale. This tended to agree with Dale, O'Rourke and Bamman (1971) who suggested that word knowledge proceeds through four stages: 1) unknown or unseen; 2) heard but not defined; 3) recognized in context; 4) known word. Eieholtz and Barbee (1961) posited a scale of six points along which they hypothesized as proceeding from complete unfamiliarity to knowledge. Taken in light of the Anglin (1970) and Miller (1967) work, this may indeed be a much too simplistic protocol.

Because the testing of vocabulary knowledge using multiple-choice synonym tests has been the accepted mode for many years, Boettcher (1980) designed a study using a multiple-choice synonym test to access the "natural acquisition path of vocabulary knowledge." A four-choice alternative format was chosen because Dale and O'Rourke in their 1979 study had determined that in addition to the correct distractor a

three-alternative pattern was the most profitable information-yielding strategy.

Based on three theoretical biases Boettcher selected the distractor pattern for her assessment test: 1) (determined by the task) a synonym; 2) (the farthest semantic choice) an antonym; 3) (to test the gradual acquisition of semantic differentiation for words that are related in meaning) a word contained in some semantically-related category to one of the hierarchical categories in which the word could be assumed to be embedded; 4) (based on word part analysis) a word that was not conveying semantic relationship to the target word, but had similar word parts (prefixes, roots, suffixes).

The subjects in the study were 47 eighth graders, 51 tenth graders and 64 twelfth graders. All were adjudged by teachers as being average or above average readers. All classrooms were intact.

Data were analyzed using Analysis of Variance and Duncan Multiple Range Tests for comparison between the means. The results indicated that across grade level the rank order of the alternative types was consistent with the synonym being the most often chosen response followed by the semantic type, orthographic type, and finally, the antonym. This study seems to offer evidence that reinforces the view that vocabulary knowledge should cease to be viewed as all-or-nothing. Recognition of the gradual process of vocabulary acquisition and the processes used by students in acquiring words should have some impact on the often used definition approach to vacabulary that is so often promulgated in content area classrooms. The definition approach reinforces the notion that vocabulary words are either known or unknown.

Summary

The small body of literature on vocabulary acquisition strategies and skills has been building from nontraditional quarters of educational research. Stotsky (1980), in a paper for publication in College Composition and Communication states, "We need to know more about how and when certain lexical and derivational resources become available to beginning writers of exposition and subject to their conscious control."

Assessing the strategies for groups in training along a career ladder, established by the work of Sticht, Fox, Hauke and Zapf (1976) seems to give precedence for this current investigation.

CHAPTER III

PROCEDURES

Introduction

Because of the basic interest of the researcher in teaching vocabulary to adult students, several *a priori* decisions governed the design and procedures of this study. Those decisions included

1. determining to use a non-experimental approach of the *Ex post facto* research design to investigate naturally occurring behavior in actual adult classrooms.
2. basing the study on a set of assumptions that were appropriate to the research hypotheses and the mathematical procedures for investigating them.
3. locating instruments to describe the vocabulary acquisition strategies used by adult students at various levels of vocabulary sophistication.
4. locating a criterion measure that was related and could be used to identify vocabulary performance.
5. using a vocational education strand that spans several different nonpublic school sectors of the community.
6. determining whether a regression prediction for both the overall group and the individual groups was possible with the given data.
7. determining the reliability and validity of the diagnostic instrument for the sample populations of the study.

These decisions lead to the detailed procedures carried out in this investigation and described fully in the remainder of the chapter. The decision to employ the Ex post facto, nonexperimental research techniques of a descriptive study allowed for the sampling of students in natural settings, but it did not allow for causal attribution. The descriptions which emerged from these data were associative. The regression predictions provided the amounts of variance in the Nelson-Denny Reading Test, Vocabulary Section score that were associated with each emerging model.

Designs

The first basic design used in the study was a Maximum R^2 Improvement Stepwise Regression Analysis. The design took the raw score data and plotted the results of the sub test means on a linear equation (previously deemed appropriate to these data) to predict which variables, if any, were associated with the variability of the mean criterion score. The criterion score was the Nelson-Denny Reading Test, vocabulary section score. This design employed the methodology of the Helwig (1978) PROC STEPWISE MAX/R^2. The second design for the investigation was necessary to interpret the results of the hypothesis test for the regression study. This was the two-way Analysis of Variance, consisting of a four by four factorial arrangement of the data for entry into the Analysis of Variance equation by each variable. The Column factors in the design were the Groups. The row factors in the design were the Quartiles within the Nelson-Denny Reading Test, vocabulary section for each separate group.

The decision to use a quartile division was determined by the pragmatic availability of a computer program for this purpose, PROC UNIVARIATE (Helwig, 1978). A secondary but very important consideration was the knowledge about internal class dynamics for adult learners was lacking. Very little was found in the literature about how the quartile of vocabulary performance by students affected their ability to acquire the information taught because of the focus of vocabulary instruction level within the technical class. Quartile blocking was undertaken to help describe these little understood dynamics and how these dynamics affected the result of the students' ability to learn and achieve within those classes. The study of quartiles may suggest that internal structure of a group's level of vocabulary achievement may be associated with the success level of students within that group.

Hypotheses

Based upon the review of the literature the purpose of this investigation was to test the following hypotheses for the regression study.

1. Ho: There is no best model of vocabulary strategies for overall prediction of the criterion vocabulary test score for the entire sample.

2. Ho: There is no best model of vocabulary strategies for prediction of the criterion vocabulary test score for each group.

Based upon the data accumulated for this study the following hypotheses for the Ex post facto, factorial Analysis of Variance was tested,

1. Ho: There is no interaction between group membership and quartile established on the standard vocabulary test within each group

for any of the seven vocabulary acquisition sub tests as measured by the "CPD" Diagnosis.

2. Ho: There are no significant differences between group performance on any of the seven sub tests of vocabulary acquisition of the "CPD" Diagnosis and their performance on the standardized vocabulary test.

3. Ho: There are no differences across groups for each of the four quartiles as measured by the standardized vocabulary test.

Any nonvalidated instrument, such as the "CPD" Diagnostic must be validated for the sample population. The following hypothesis was tested to investigate the validity of the "CPD" Diagnosis,

1. Ho: The instructions of the "CPD" Diagnosis have no effect on the students' scores on any of the seven sub tests of vocabulary acquisition strategies.

Further procedures were employed to augment the information derived from this hypothesis test. One procedure involved calculating Pearson-r Correlation Coefficients for the data of the principal portion of the study. Another was the SAS program PROC ITEM (Smith, D., 1981) which furnished detailed item analysis for the entire set of sub tests. Finally, the KR-20 and KR-21 (Richardson & Kuder 1939) formulas, which are measures of internal consistency, were used to determine the reliability of the tests.

Instrumentation

The first instrument employed to test the hypotheses stated above was the criterion measure, the Nelson-Denny Reading Test. This test was administered in its entirety, but only the vocabulary section data

were analyzed. The second instrument was the "CPD" Diagnosis (Brown, J.I. 1980). This is a battery of seven tests designed to investigate vocabulary acquisition strategies of students enrolled in vocabulary improvement classes. The "CPD" Diagnosis and the Nelson-Denny Reading Test were authored by the same individual. The company that published the "CPD" Diagnosis granted permission to reproduce the tests. The permissions are included in Appendix E. The third instrument was a rewritten set of instructions for the "CPD" Diagnosis and for which the company owning the copyright granted permission. The instructions are in Appendix B.

The Nelson-Denny Reading Test (Brown, J.I., 1973) has two forms--Form C and Form D. Each form has 100 vocabulary items and eight reading passages with 36 comprehension questions distributed throughout the eight passages. The Nelson-Denny Reading Test is timed with 10 minutes permitted for the vocabulary section and 20 minutes permitted for the comprehension portion of the test. The first minute of the comprehension test is a measure of words read per minute. This measure was not used in the compilation of these data. The Nelson-Denny Reading Test provides a set of "cut time" instructions for adult students. These instructions allow seven and one-half minutes of work time on the vocabulary test and 15 minutes work time on the comprehension test. The Nelson-Denny Reading Test was designed for students from grades 9-16.

The students were allowed to work at their own speed on the "CPD" Diagnosis. This test consists of seven sub-tests: Context A, Context B, Memorization, Identification, Application, and Generalization of Word Parts, and Dictionary. Each sub-test, with the exception of Context A and B which shared the same items contained 20 items.

The first test: Context A, consists of 10 items made up of a one word stem, and five definition distractors.

The second test: Context B, includes 10 sentences containing the words in Context A. The examinees were requested to take the 10-item test in Context A again following the reading of the sentences.

The third test: Memorization, measures rote knowledge of the common meanings of ten prefixes and ten roots.

The fourth test: Identification, measures ability to identify prefixes and roots as they normally appear in words.

The fifth test: Application, measures ability to use the meanings of prefixes and roots to unlock meanings of unknown words.

The sixth test: Generalization, measures how accurately one can use information about prefixes and roots in a variety of situations.

The seventh test: Dictionary, measures how accurately one can use an assembled group of dictionary entries to locate information about words, prefixes and roots.

Subjects

The validation study was conducted in March of 1981. Four groups of students, all in the twelfth grade of a university laboratory school, were selected on the basis of reading scores that exceeded 9th grade reading level on the standardized test used by the school. The four groups comprised eleven students, eight students, eight students and eleven students for a total of 38 students. Raw scores Appendix C.

The groups were each supplied with a duplicated test booklet. Time was allowed for the students to complete each test before starting the next test. The four treatments were 1) the instructions included by

the "CPD" Diagnostic author were supplied to group one intact; 2) the instructions included by the "CPD Diagnostic" author were taped and the tape was played along with the written instructions; 3) the instructions included by the "CPD" Diagnostic author were removed and the instructions supplied in Appendix B were provided in the printed array version of the test; 4) the altered instructions and the original taped instructions were presented to the students, who were asked to listen to the instructions and complete the exercises. Time was allowed for the students to complete each test before starting the next test.

The selection of subjects for the study was determined by the need to locate four groups ranging from novice to expert along a career ladder. The Allied Health Professions were selected. All the students participating in the sample had been selected by their respective programs through testing which involved a vocabulary component. Early in 1981 contacts were made with the Job Corps Florida facility containing an Allied Health Professions training component, a Comprehensive Employment and Training Program also having an Allied Health Professions program, a two-year college nursing program, and a graduate program training master's level Allied Health Professions administrators.

Each of the program directors was asked to select a class of approximately 20 students who all had reading levels above the 9th grade. At several sites more than twenty students took one of the tests; however, at all four sites only eighteen students per program completed both tests. Only those students who completed both tests in a group administration were included in the principal study analysis.

Several of the students in the CETA and the Job Corps samples did not score above the 9th grade level according to the Nelson-Denny Reading Test norms, but they were included in their group's mean analysis if they had completed both tests and were included in the group by their program directors.

In the validation of the test instructions, the subjects were four groups of 12th grade students at a University Laboratory school. Subjects' levels all exceeded 9th grade on standardized tests.

Setting and Administration

The validation study took place during April of 1981. Over a two week period the four sample groups were asked to take the untimed "CPD" Diagnosis. They were given the separate forms of the test with either the intact instructions or the altered instructions. Groups 2 and 4 had versions of the original instructions read on the tape by the researcher. Because these tests were untimed, it was necessary to allow for completion of each test by all students before going on to the next test. This intrusion with the task did not seem to interfere with the results.

The CETA administration took place with a one week time lapse between the criterion variable and the diagnostic test. The researcher gave both administrations of the tests. They were given in the same classrooms where instructional activities took place for the students.

The administration to the Job Corps group took place with a one week time lapse between the criterion reading test and the diagnostic test. The researcher gave both administrations of the tests, in the same rooms where instructional activities took place for the students.

The administration of the two-year college group took place with a one week time lapse between the criterion reading test and the diagnostic test. The researcher gave both administrations of the tests. They were given in the same classrooms where instructional activities took place for the students.

The administration to the graduate group took place during a one night opening session class for a new quarter. The students, many of whom had worked a full day before arriving for class, took both tests with a short break between sittings. The cut time administration for adults was used for the criterion measure.

The usual administration of the criterion measure takes a carefully timed 10 minutes for the vocabulary segment and 20 minutes for the comprehension segment with the first minute being timed reading. The cut time adult instructions are 7.5 minutes for the vocabulary section and 15 minutes for the comprehension section with the same first minute as timed reading.

The principal study data were collected in June and July of 1981 through group administrations of the two tests by the researcher at the sites of the four programs. The three programs--Comprehensive Employment and Training Act, the two-year college nursing program, and the Allied Health Administrators program--were located in large metropolitan areas in southern Florida. The Job Corps Allied Health Professions training program was located in a city with a population of approximately 100,000. The Job Corps Center was a residental facility.

All the tests were administered to all of the students in group administrations. The Nelson-Denny Reading Test was given first in all

cases. And only students who completed both tests were considered for analysis of data.

Data Analysis

The data were coded on cards and programs were prepared to enter the computer. All students had been previously given an individual interpretation of their scores on both tests. The researcher gave the reports of the criterion measure and the instructors returned the "CPD" Diagnosis results and reports of those data.

Appropriate statistical tests were used to test the hypotheses. A Multiple Analysis of Variance (MANOVA) procedure was used to test the hypotheses validating the instructions under the assumption that the seven sub tests were replications of the same information.

The coding for the students responses for the validation, regression and Ex post facto study was carried out in the same way. A key of 0 = wrong, and 1 = right was used for entering these data in the computer. Table 1 in Chapter IV reported the totals of these entries.

The investigation planned to use the MANOVA procedure throughout. However, inspection of the Correlation data the Pearson-r coefficients of correlation for the principal study (Appendix D, Table D-1) demonstrated that Context A was negatively correlated with the vocabulary scores and with Application and therefore was not a replicate measure of the other variables. It was then decided to select the two-way Analysis of Variance with the criterion measure serving as the blocking factor.

The detailed procedures for analyzing these data were 1) establishment of quartiles for each group based on the Nelson-Denny Reading Test, vocabulary section, using PROC UNIVARIATE (Helwig, 1978) and 2) use of

SAS procedure PROC ITEM (Smith, D., 1981) for calculating inter-item reliability and internal consistency.

The PROC ITEM procedure was used to compute the mean, standard deviation, standard error of measurement, high and low scores for each item for the total N = 72 sample. It also furnished the KR-20 and KR-21 data for the sample on the "CPD" Diagnosis. These data are included in Appendix D, Table D-1).

The next procedure used was the STEPWISE MAXIMUM R^2 IMPROVEMENT (Helwig, 1978) developed for both the total sample N = 72 and the separate group samples, each group N = 18. This tested the hypotheses that there was no model of the sub-tests that would predict the overall Nelson-Denny Reading Test, vocabulary test section mean score, and the by-group hypothesis that stated that there was no model by-group of sub-test variables to predict the Nelson-Denny Reading score. The rejection criteria were the type II sums of squares, using 70 to 64 degrees of freedom, and a $p < .05$, while maintaining the maximum R^2 improvement possible for the combination of variables. The rejection criteria for the by-group used the same type of sums of squares, but the degrees of freedom were 14 for Group II, 12 for Group III, and 10 for Group IV. There would have been 16 for Group I if a model had emerged.

In order to be able to interpret the computer generated information that emerged from the various regression analyses, the two-way Analysis of Variance was carried out. Where differences of statistical significance were demonstrated from these data, follow-up strategies were applied by hand calculation to locate the exact differences. These hand calculations compared all possible pairwise comparisons for the significant variables. The Analysis of Variance tested three null hypotheses

for each strategy measured on the sub-tests of the "CPD" Diagnosis. These hypotheses were:

1. there is no interaction between Group and Quartile for any variable;
2. there is no significant difference for any group on any variable;
3. there is no significant difference for any quartile across groups.

If no interaction occurred, then the follow-up strategies for the ANOVA to determine where the differences for either of the Group or Quartile analyses resided would be concerned only with the summary means of the individual sub-test variables (Appendix C). If there, however, were an interaction, then the individual cell means would be available for analysis in the pairwise comparison procedures used to locate the group or quartile where the significance or statistical difference occurred.

For all data that emerged significant for interaction, a separate Simple Main Effects "F" was recalculated and reported. The Type IV sums of squares "F" was accepted for all variables for which there was no interaction hypothesis rejection. The criteria for rejection of all of these hypotheses was $p < .05$.

Summary

The need for correlational data on vocabulary acquisition strategies for groups of adult students was suggested by Gates (1947) and Gage and Giaconia (1981). The work of Boettcher (1979) further demonstrated that there are differences in preferred or efficient strategies used. No one had tried to establish the level of students' knowledge about any of the theoretically advanced variables. This study attempted to design some procedures to measure the depth of knowledge about

seven sub-tested variables similar to many of the commonly advanced vocabulary acquisition strategies (Herber, 1978). It was also anticipated that level of knowledge might be found to be a predictor of a standardized vocabulary test score. The challange of building teaching materials that were empirically and experimentally based with the vocabulary development of the vocational student in mind was the principal reason for initiating the research investigation included in this report.

CHAPTER IV

RESULTS

Introduction

The purpose of this study was to investigate the vocabulary performance of students in Allied Health Professions courses at different levels along a career ladder. Through the use of a vocabulary screening test and a related diagnostic test it was expected that information about the types of training for helping lower vocabulary students could be collected.

Data were collected to assist with the empirically derived description of vocabulary acquisition strategies as used by four groups of 72 students in all. The data were subjected to several analyses designed to respond to the hypotheses tested in this investigation.

Until very recently it was computationally difficult to base educational experiments on empirically derived or observed variables. Computer advances have provided means of carrying out complex and detailed analyses that have begun to change the types of research questions being asked. The investigations in this report employed some of these advanced computer programs to analyze data collected according to the procedures in Chapter III.

This information made it possible to respond to the following assumptions:

1) All test scores of students in the total sample and by groups could be analyzed in both the Regression and the ANOVA analyses.

2) The diagnostic tests' results, when correlated with, or regressed on the linear equation would develop a pattern or model that would be associated with a significant amount of the variance in the vocabulary test, for the total sample and for individual groups.

3) The straight line, linear equation model of analysis would be appropriate for conducting those regression analyses.

4) The information derived from the regression analysis of these data could be explained through a two-way Analysis of Variance with the appropriate follow-up comparison of all possible pairwise contrasts, wherever significance emerged.

5) The diagnostic tests were reliable and valid for these population samples.

6) The instructions furnished by the diagnostic test would cue the desired task behaviors for students similar to those in the target population.

Appendix C, Table C-8 includes the raw scores on which these data were based. The descriptions of the vocabulary assignment strategy behavior of these 72 students emerged from the various tests reported below.

The description of these data consisted of two regression analyses reports and a two-way Analysis of Variance. The first regression analysis searched the data for a possible model or collection of the

seven sub test variables, Context A, Context B, Memorization, Identification, Application, Generalization and Dictionary, to predict the mean vocabulary score for all 72 students. The second searched for a model of the sub-test variables to predict the mean vocabulary scores for each group. The Analysis of Variance and the follow-up pairwise comparisons allowed for full examination of the significant differences to explain the computer's predicted model. The vocabulary criterion measure, the Nelson-Denny Reading Test, vocabulary section, served as the dependent variable of the regression analysis. The sub-test scores served as the dependent variables of the Analysis of Variance and the vocabulary criterion scores served as the blocking factor. The idea of blocking by the quartiles on the vocabulary test allowed for examination of internal dynamics of the classes, and for performance across groups.

Regression Results

The Maximum R^2 Stepwise analysis (Maximum R^2 Improvement) for the total group N = 72, is reported in Table 1. This description contributes to several important factors in the study. First, it responds to the question about whether it was possible to locate from among these sub-test variables a group that could reflect the vocabulary scores of the participants. Second, the R^2 indicates how much of the variance in that mean score is associated with the prediction. Third, it demonstrates that an overall group description, given the diversity of the group, is possible.

The Maximum R^2 Stepwise analysis, by-group, provided a much clearer picture of how each individual group of students functioned both on the sub-tests and on the criterion measure.

TABLE 1

STEPWISE MAXIMUM R-SQUARE IMPROVEMENT FOR
DEPENDENT VARIABLE VOCABULARY

N = 72 $P < .05$

Step	Source	Predicting Type II Sum of Squares	df	F	Prob. > F	R^2
1.	Generalization	16766.1089	70	75.58	.0001*	.5192
2.	Application	4118.8264	69	24.91	.0001*	.646
	Generalization	4500.8071		27.22	.0001*	
3.	Memorization	955.1675	68	6.21	.0151*	.6763
	Application	3277.7130		21.32	.0001*	
	Generalization	1188.2489		7.73	.0070*	
4.	Context A	495.4382	67	3.33	.0727	.6916
	Memorization	980.580		6.60	.0124*	
	Application	3156.5784		21.24	.0001*	
	Generalization	1249.8678		8.41	.0050*	
5.	Context A	585.5730	66	3.95	.0510	.6969
	Context B	172.74020		1.16	.2844	
	Memorization	765.5593		5.16	.0263*	
	Application	2472.6660		16.68	.0001*	
	Generalization	2025.2874		6.85	.0110*	
6.	Context A	575.4774	65	3.86	.0538	.6997
	Context B	93.8234		.63	.4306	
	Memorization	738.5591		4.95	.0295*	
	Application	2324.0007		15.58	.0002*	
	Generalization	638.4142		4.28	.0475*	
	Dictionary	90.1457		.60	.4398	
7.	Context A	609.9619	64	4.04	.0486*	.7009
	Context B	120.9627		.80	.3740	
	Memorization	657.3058		4.36	.0409*	
	Identification	37.1739		.25	.6214	
	Application	2107.2049		13.96	.00004*	
	Generalization	510.9451		3.39	.0704	
	Dictionary	86.5846		.57	.4516	

The model developed by the regression analysis accounted for approximately 70% of the variance in the vocabulary score on the Nelson-Denny Reading Test.

Table 1 presents, the total N = 72 model. Tables 2, 3, and 4 present the Group II, III, and IV models. There was no significant by-group model presented of these data for Group I.

The regression Stepwise Maximum R^2 analysis used in this study sought to predict the best one-to-seven variable model that reflected some amount of variance in the vocabulary score for either the total group or the individual groups on the Nelson-Denny Reading Test, (Brown 1973). The R^2 statistic reflects the percent of variance that the individual predicted model or group (N = 72) predicted model is associated with. The stepwise improvement reflected the addition of each variable.

The null hypotheses were tested by the regression analysis procedure. The first was, Ho: There is no best model of vocabulary strategies for overall prediction of the dependent measure vocabulary score. The second was, Ho: There is no best model by-group to predict dependent measure vocabulary score for that group.

All of the hypotheses were tested at the $p < .05$ level of significance. The first hypothesis was rejected. For the entire group (N = 72), Table 1, with 70% of the variance accounted for in the dependent vocabulary score, the best models were shown by the results that follows:

1) The best one variable model, R^2 = 52%, was Generalization of word part information.

2 The best two variable model, R^2 = 65%, was Application and Generalization.

3) The best three variable model, R^2 = 68%, was Application, Generalization, and Memorization.

TABLE 2

STEPWISE MAXIMUM R-SQUARE IMPROVEMENT FOR DEPENDENT VARIABLE VOCABULARY

Group II

N = 18 $P < .05$

Step	Source	Predicting Type II Sum of Squares	df	F	Prob. > F	R^2
1.	Context B	172.77553191	16	8.71	.0094*	.3526
2.	Context B	233.28945323	15	13.68	.0021*	.4781
	Dictionary	61.50778634		3.61	.0769	
3.	Context B	113.74074223	14	6.80	.0206*	.5224
	Generalization	21.70864882		1.30	.2736	
	Dictionary	83.05333406		4.97	.0427*	
4.	Context B	80.60243414	13	4.79	.0475*	.5536
	Identification	15.29777761		.91	.3577	
	Generalization	18.88656173		1.12	.3086	
	Dictionary	50.13860115		2.98	.1080	
5.	Context B	61.02831493	12	3.39	.0906	.5585
	Memorization	2.37545742		.13	.7229	
	Identification	15.52047188		.86	.3718	
	Generalization	11.36048792		.63	.4427	
	Dictionary	36.84931527		2.04	.1783	
6.	Context A	1.7307464	11	.09	.7714	.5620
	Context B					
		62.63641972		3.21	.1007	
	Memorization	2.16484080		.11	.7453	
	Identification	11.64691825		.60	.4560	
	Generalization	13.05301381		.67	.4307	
	Dictionary	38.53119043		1.98	.1875	
7.	Context A	1.46319883	10	.07	.7992	.5625
	Context B	58.35542675		2.72	.1300	
	Memorization	2.30103072		.11	.7499	
	Identification	11.39353678		.53	.4827	
	Application	.25921236		.01	.9146	
	Generalization	11.54298523		.54	.4799	
	Dictionary	37.09994264		1.73	.2177	

The model developed by the regression analysis accounted for approximately 56% of the variance in the vocabulary score on the Nelson-Denny Reading Test.

TABLE 3

STEPWISE MAXIMUM R-SQUARE IMPROVEMENT FOR DEPENDENT VARIABLE VOCABULARY

Group III

N = 18 P < .05

Step	Source	Predicting Type II Sum of Squares	df	F	Prob. > F	R^2
1.	Application	1171.97419355	16	7.67	.0137*	.3241
2.	Context A	578.06905674	15	4.65	.0478*	.4839
	Application	722.05704339		5.80	.0293*	
3.	Context A	926.05379653	14	9.16	.0091*	.6086
	Context B	450.94870597		4.46	.0531	
	Application	1145.07314551		11.33	.0046*	
4.	Context A	763.80690044	13	7.29	.0182*	.6232
	Context B	465.73000913		4.44	.0550	
	Application	867.65137576		8.28	.0130*	
	Dictionary	52.69402800		.50	.4908	
5.	Context A	637.20095365	12	6.96	.0217*	.6454
	Context B	490.71291465		4.40	.0577	
	Application	641.81823726		5.76	.0335*	
	Generalization	25.52155706		.23	.6408	
	Dictionary	30.14880993		.27	.6124	
6.	Context A	697.31646121	11	5.90	.0335*	.6454
	Context B	504.26080728		4.44	.0617	
	Identification	54.62518161		.47	.5078	
	Application	663.08994793		5.69	.0362*	
	Generalization	72.79713008		.62	.4461	
	Dictionary	3.14534222		.03	.8725	
7.	Context A	666.23041138	10	5.20	.0458*	.6554
	Context B	440.77828246		3.44	.0934	
	Memorization	.02906330		.00	.9883	
	Identification	49.75926087		.39	.5472	
	Application	552.75093423		4.31	.0646	
	Generalization	49.86379182		.39	.5468	
	Dictionary	2.92771783		.02	.8829	

The model developed by the regression analysis accounted for approximately 65% of the variance in the vocabulary score on the Nelson-Denny Reading Test.

TABLE 4

STEPWISE MAXIMUM R-SQUARE IMPROVEMENT FOR
DEPENDENT VARIABLE VOCABULARY

Group IV

N = 18 P < .05

Step	Source	Predicting Type II Sum of Squares	df	F	Prob. > F	R^2
1.	Dictionary	3646.60317460	16	25.70	.0001*	.6113
2.	Application	729.74314602	15	7.11	.0176*	.7397
	Dictionary	1569.83960428		15.29	.0014*	
3.	Identification	108.43697762	14	1.06	.3206	.7580
	Application	566.11410193		5.54	.0338*	
	Dictionary	1205.05751451		11.78	.0040*	
4.	Context A	99.12502160	13	.97	.3434	.7748
	Identification	185.37942260		1.81	.2017	
	Application	660.81124695		6.45	.0247*	
	Dictionary	1028.94910309		10.04	.0074*	
5.	Context A	306.12651102	12	3.45	.0878	.8202
	Context B	268.85817977		3.03	.1071	
	Identification	409.54405390		4.62	.0527	
	Application	458.57853006		5.17	.0421*	
	Dictionary	321.05041595		3.62	.0813	
6.	Context A	417.79020777	11	5.23	.0430*	.8515
	Context B	327.35806875		4.10	.0679	
	Identification	594.40096548		7.44	.0197	
	Application	415.69244367		5.20	.0435*	
	Generalization	184.87713994		2.31	.1564	
	Dictionary	505.89204483		6.33	.0287*	
7.	Context A	409.92095838	10	4.68	.0558	.8520
	Context B	326.32674556		3.73	.0824	
	Memorization	2.98063792		0.03	.8573	
	Identification	597.18442030		6.82	.0260*	
	Application	414.56107805		4.73	.0546	
	Generalization	159.56139247		1.82	.2069	
	Dictionary	505.71358939		5.77	.0371*	

The model developed by the regression analysis accounted for approximately 85% of the variance in the vocabulary score on the Nelson-Denny Reading Test.

4) The best four variable model, R^2 = 69%, was Context A, Memorization, Application, and Generalization.

5) The best five variable model, R^2 = 69%, was Context B, Context A, Memorization, Application, and Generalization.

6) The best six variable model, R^2 = 70%, was Dictionary, added to Context A, Context B, Application, Generalization, and Memorization.

7) The best seven variable model, R^2 = 70%, was Identification, added to Dictionary, Context A, Context B, Memorization, Application, and Generalization.

The addition of the mean scores for each of the seven variables changed the significance of the variables $p < .05$. Generalization lost significance only after addition of the mean score for Identification. Application, the added factor in step 2, maintained significance throughout the entire stepwise process for the N = 72 analysis. Memorization, the added factor in step 3, maintained significance throughout the entire remaining stepwise process for the N = 72 analysis. Context A, the added factor in step 4, became significant with the addition of the mean score for Identification in step 7. Dictionary, added in step 6, never demonstrated significance as a predictor or dependent vocabulary score for the entire group of N = 72.

A slightly different picture emerged from the by-group analyses. Tables 2, 3 and 4, present these results. These three tables reflect the second hypothesis test in the regression analysis, Ho: There is no best model of vocabulary strategies for each group to predict the dependent measure vocabulary score. The second hypothesis was accepted for Group I, and rejected for the other three groups. The best models for Groups II, III, and IV were as follows:

Group II, 1) The best one variable model, R^2 = 35%, was Context B.

2) The best two variable model, R^2 = 47%, was Context B, and Dictionary.

3) The best three variable model, R^2 = 52%, was Context B, Generalization, and Dictionary.

4) The best four variable model, R^2 = 56%, was Context B, Identification, Generalization, and Dictionary.

5) The best five variable model, R^2 = 56%, was Context B, Memorization, Identification, Generalization, and Dictionary.

6) The best six variable model, R^2 = 56%, was Context A, Context B, Memorization, Identification, Generalization, and Dictionary.

7) The best seven variable model, R^2 = 56%, was Context A, Context B, Memorization, Identification, Application, Generalization, and Dictionary.

Group III, 1) The best one variable model, R^2 = 32%, was Application.

2) The best two variable model, R^2 = 48%, was Context A, and Application.

3) The best three variable model, R^2 = 60%, was Context A, Context B, and Application.

4) The best four variable model, R^2 = 62%, was Context A, Context B, Application, and Dictionary.

5) The best five variable model, R^2 = 65%, was Context A, Context B, Application, Generalization, and Dictionary.

6) The best six variable model, R^2 = 65%, was Context A, Context B, Identification, Application, Generalization, and Dictionary.

7) The best seven variable model, R^2 = 66%, was Context A, Context B, Memorization, Identification, Application, Generalization, and Dictionary.

Group IV, 1) The best one variable model, R^2 = 61%, was Dictionary.

2) The best two variable model, R^2 = 74%, was Application and Dictionary.

3) The best three variable model, R^2 = 76%, was Identification, Application, and Dictionary.

4) The best four variable model, R^2 = 77%, was Context A, Identification, Application, and Dictionary.

5) The best five variable model, R^2 = 82%, was Context A, Context B, Identification, Application, and Dictionary.

6) The best six variable model, R^2 = 85%, was Context A, Context B, Identification, Application, Generalization, and Dictionary.

7) The best seven variable model, R^2 = 85%, was Context A, Context B, Memorization, Identification, Application, Generalization and Dictionary.

While these were the order of the variables as they were entered into the models, they all did not maintain significance. Tables 1, 2, 3, and 4 furnish the amounts of significance for each of the variables in each of the model statements.

Summary of the Regression Analysis

The regression analysis produced two sets of variables that were significant predictors of the dependent variable, the Nelson-Denny Reading Test Vocabulary section score. One set of predictors was generated for the total group, N = 72. Another set of predictors was

generated for the individual groups, N = 18 per group. The only variable that shared prediction between the two analyses was Application which was a significant predictor for Groups III and IV as well as the overall sample. A listing of the separate significant factors is presented below.

Overall N = 72

1. Generalization
2. Application
3. Memorization
4. Context A

By-Group N = 18

Group I	Group II	Group III	Group IV
no significant model developed	Context B Dictionary	Application Context A Context B	Dictionary Application Identification

The data upon which these predictions were based were, the raw scores in Appendix C. The predictions are found on Tables 1, 2, 3, and 4 in this chapter.

Analysis of Variance Results

Separate from the Regression Analysis was the two-way Analysis of Variance. This analysis compared the performance of each of the four Groups on each variable as broken down by the quartile scores of each Group on the dependent variable, The Nelson-Denny Reading Test, Vocabulary section. These results are presented in Tables 6 for Dictionary, and 7 for Context A, Context B, Memorization, Identification, Application, and Generalization.

Three null hypotheses were tested.

1) Ho: There is no interaction between Group and Quartile for any variable.

2) Ho: There are no differences between any of the four Groups on any of the variables.

3) Ho: There are no differences between any of the four Quartiles across Groups for any variable.

The factor Quartile was established through the procedure PROC UNIVARIATE (Helwig, 1978). These data are furnished in Table 5 in this chapter. The Quartiles represented the placement within each group of scores marking the 25%, 50%, and 75% distribution of scores for members of that Group. These Quartiles represent the normal types of divisions among students in any typical adult classroom. Creating the Quartile blocks factor provided information about intra class dynamics as to how well the performance on the various sub-tests of the diagnostic instrument reflected the within group placement by performance on the vocabulary test.

The results of the three ANOVA hypothesis tests were recorded in Tables 6 and 7 in this chapter. The ANOVA itself first tested the three hypotheses for the entire N = 72 for all Quartiles across all Groups. The mean tables developed from the raw data are found in Appendix C, Tables 1 through 8.

Hypothesis 1 was not rejected for Context A, Context B, Memorization, Identification, Application or Generalization. It was rejected for Dictionary. There was an interaction between Group and Quartile on the Dictionary variable. This meant that the Simple Main Effects 'F' statistic was calculated and was reported in Table 6. Quartiles 1, 2, and 4 demonstrated significance. Quartile 3 across Groups was not significant and no further follow-up was necessary. For the other Quartiles, significance indicated that at least one of the

TABLE 5

QUARTILES WITHIN GROUPS ON NELSON-DENNY VOCABULARY TEST SECTION

N=72

N	Group	Mean	SD	25%	50%	75%	100%	Range	Mode
18	1	10.5556	5.55425	6	9	14.5	22	20	6
18	2	12.3333	5.36875	8.5	12	16.25	22	20	7
18	3	47.6667	14.5844	35.25	49	53.25	82	58	50
18	4	44.5556	18.6555	26.25	47.5	57.75	79	63	31.5

TABLE 6

DICTIONARY

Summary ANOVA N = 72

Source	df	SS	F	PR F
Group * Quartile	9	375.835	3.82	.0009*

Simple Main Effects by Quartile				Critical 'F'
Quartile 1	3, 56	54.45588235	4.9804*	2.76
Quartile 2	3, 56	35.898966	3.2832*	2.76
Quartile 3	3, 56	19.3568	1.77	2.76
Quartile 4	3, 56	147.75	13.5128*	2.76

Bonferroni 't' Test

Quartile 1	Quartile 2	Quartile 4
1-1/2-1 = -1.4,4.4	1-2/2-2 = -3.24,2.58	1-4/2-4 = .85,6.65*
1-1/3-1 = -8.19,-2.56*	1-2/3-2 = -8.65,-2.29*	1-4/3-4 = -9.93,-3.59*
1-1/4-1 = -.63,5.63	1-2/4-2 = -3.407,3.137	1-4/4-4 = 12/64,-6.36*
2-1/3-1 = -10.25,-4.25*	2-2/3-2 = -8.14,-2.14*	2-4/3-4 = 7.5,13.5*
2-1/4-1 = -1.95,3.95	2-2/4-2 = -2.89,3.01	2-4/4-4 = -16.2,-10.3*
3-1/4-1 = 5.03,11.47*	3-2/4-2 = 1.98,8.42*	3-4/4-4 = 5.97,.47

*reject, contrast showed
significant differences

/ = versus for comparison

1-1...4-4 = cell by Group and Quartile in Appendix C, Table C-7.

TABLE 7

SUMMARY TABLE AND FOLLOW-UP BY VARIABLES

Summary ANOVA N = 72

a. no interaction N = 72

a Source	df	Sum of Squares	F	PR F	N = 72
Context A	3, 56	29.31809018	2.49	.0685	Group
	3, 56	12.67969305	1.08	.3671	Q
Context B	3, 56	97.63900593	11.40	.0001*	Group
		54.05691358	6.31	.0010*	Q
Memorization	3, 56	572.09269430	22.27	.0001*	Group
		69.89737954	2.72	.0522	Q
Identification	3, 56	109.60502517	3.80	.0149*	Group
		93.34386890	3.24	.0285*	Q
Application	3, 56	490.87948869	16.20	.0001*	Group
		183.23921702	6.05	.0013*	Q
Generalization	3, 56	632.89095700	18.30	.0001*	Group
		267.48439890	7.73	.0002*	Q

b. follow-up by Group Tukey's Procedure Results N = 18

Context A = non significant at $p < .05$, no follow-up comparisons carried out.

Context B, Group I was not different from Group II.
Group III was not different from Group IV.
Both Groups III and IV were greater than Groups I and II.

Memorization, Group I was not different from Group II.
Group III was not different from Group IV.
Both Groups III and IV were greater than Groups I and II.

TABLE 7

CONTINUED

Identification, Group II was different from Group III. No other Groups differed significantly by pairwise comparison.
Application, Group III differed from all the other groups. Group IV differed from all the other groups. Group I and II did not differ from one another.
Generalization, Group I was not different from Group II. Group III was not different from Group IV. Both Groups III and IV were greater than Groups I and II.
c. Quartile Follow-Up Bonferroni "t" Results N = Q
Context A = non significant at $p < .05$, no follow-up comparisons carried out.
Context B, Quartile 1 was lower than the other 3 quartiles for this variable. Although 2 demonstrated differences from 3, 2 did not differ from 4, and 3 did not differ from 4.
Memorization, non significant at $p < .05$, no follow-up comparisons carried out.
Identification, The quartiles across groups that differed were 3 was greater than 1 and 4 was greater than 3. None of the other quartiles differed.
Applications, Quartiles 1 and 2 did not differ on this variable. Quartiles 3 and 4 did not differ on this variable. But the two upper quartiles (3 and 4) were significantly higher than the two lower quartiles (1 and 2).
Generalization, Quartile 1 was significantly lower than the other three quartiles on this variable. There were no other significant differences.
N = Q 1 = 22 Q 3 = 17 Q 2 = 22 Q 4 = 16

cell means for one of the Groups in that Quartile was not in the proper order of progression from lowest (Group I) to highest (Group IV). The comparisons of all possible pairwise contrasts were carried out using the Bonferroni "t" test. This is a measure that allows for unequal number of members in the calculation of the cell means being compared. The results of these comparisons are found in Table 6. For Quartile 1, Group III was significantly different from Groups II, I, and IV. For Quartile 2, Group III was again significantly different from Groups II, I, and IV. For Quartile 4, Group III did not differ from Group IV, but it did differ from I and II.

With the exception of Group IV in the 3rd and 4th Quartile, Group III was significantly higher than all the other groups on this variable. In light of this interaction and the fact that in the By-group regression prediction Dictionary was a significant predictor of vocabulary score for Group II and Group IV, this variable would seem to be meritorious of further study.

Hypothesis 2 was not rejected for Context A. Hypothesis 2 was rejected for Context B, Memorization, Identification, Application and Generalization. It was not a consideration for Dictionary for which the interaction previously discussed was present. The variables for which this hypothesis was rejected indicated that at least one group of the four was significantly different from the other groups. Tukey's procedure showed that for Context B, Group I did not differ from Group II, and Group III did not differ from Group IV. Both Groups III and IV were greater than Groups I and II. For Memorization, again, Groups I and II did not differ from one another, and Groups III and IV did not differ from one another, but Groups III and IV were greater than

Groups I and II. For Identification only Groups II and III were statistically different. For Application, Groups I and II did not differ from one another, and Group III differed from all of the other Groups as did Group IV. For Generalization, Group I again did not differ from Group II, and Group III did not differ from Group IV, but Groups III and IV were statistically greater than Groups I and II.

Thus for the factor Group, Group I did not differ from Group II on Context B, Memorization, Application, or Generalization. Thus it would be reasonable to suggest that any model containing those variables would be appropriate for Group I as well as Group II, even though we do not have any significant R^2 Improvement projection on which to base that suggestion.

The Marginal means for the factor Quartile do not contain equal numbers of subjects (Tables C-1-7) so the Tukey's procedure could not be used to conduct the all possible pairwise comparisons for those variables for which Quartile was a significant variable. The Bonferroni "t" test was carried out instead. This test is slightly less powerful than the Tukey's procedure, but furnishes essentially the same data about the differences that created the significances.

Context A was not significant for Group or Quartile and no further follow-up was carried out.

Hypothesis 3 was rejected for Quartile across Groups for Context B. At least one Quartile across Groups was significantly different from the other three. Quartile 1 was lower across all Groups than the other Quartiles (Table 7 continued).

Hypothesis 3 was not rejected for Quartile across Groups for Memorization and no further follow-up comparisons were carried out.

Hypothesis 3 was rejected for Identification. Quartile 3 was greater than Quartile 1, and Quartile 4 was greater than Quartile 3. No other differences were significant.

Hypothesis 3 was rejected for Application. Quartile 1 and Quartile 2 were not different and Quartile 3 and Quartile 4 were not different from each other, but Quartiles 3 and 4 were greater than Quartiles 1 and 2.

Hypothesis 3 was rejected for Generalization. Quartile 1 across all Groups was significantly lower than all of the other Quartiles. There were no further differences.

For Quartile those variables of consequence for further research based on these data were Context B, Identification, Application, Generalization and Dictionary.

Summary of the Analysis of Variance

The Analysis of Variance produced information necessary to explain the regression predictions in terms of significance for Group, or Quartile for the various variables that were significant predictors of the dependent variable vocabulary score. The two different significance levels were both at $p < .05$, however they must be interpreted in different ways. The regression levels of significance must be regarded in the terms of building the R^2 Improvement formula pattern of prediction of one score by the other. The Analysis of Variance significance furnished information on which levels of the variable Quartile were different from one another for all Groups, and the Group factor assessed which Groups were significantly different from the others for the individual variables.

For overall scores, the two analyses taken together with the follow-up pairwise comparisons demonstrated that for Generalization, Group I was not significantly different from Group II, but that these two groups were significantly lower than Groups III and IV. For Quartile, Quartile 1 was significantly lower than the other three Quartiles. For Application Group I did not differ from Group II. Group III differed from all of the other Groups and Group IV differed from all of the other Groups. For Quartile, Quartile 1 did not differ from Quartile 2, Quartiles 3 and 4 did not differ from one another. Quartiles 3 and 4 were significantly higher than Quartiles 1 and 2. For Memorization, Group I was not different from Group II, and Group III was not different from Group IV. But, Groups III and IV were significantly greater than Groups I and II. For Context A, there was no significant differences for either Group or Quartiles.

For Group scores, the Analysis of Variance for the factors that emerged in the by-group regression prediction that were different from those in the overall analysis were Context B, Dictionary, and Identification. For Context B the follow-up analysis showed that, Group I was not different from Group II, and Group III was not different from Group IV. But, that Groups III and IV were significantly higher than the other two Groups. Quartile 1 was lower than the other three Quartiles for this variable. For Dictionary there was an interaction, Quartile follow-ups across Groups showed that for Quartile 1, Group III was significantly higher than the other Groups. For Quartile 2 again Group III was the significantly different Group. There was no significant difference for any of the Groups on Quartile 3. And for Quartile 4, all Groups differed except Group III was not different from

Group IV. For Identification, only Group III showed a significant difference from Group II. There were no other Group differences. For Quartile across Groups, 3 was greater than 1 and 4 was greater than 3. No other Quartile differences were significant. These ANOVA results demonstrated the variables that were significant in the regression analysis could be used to explain the behavior of the students in relation to sub-test performance and vocabulary achievement measure.

Reliability and Validity Results

The results of PROC ITEM (Smith 1981) analysis produced inter item ratings for the KR-20 and KR-21 (Richardson and Kuder 1939). These results (Table D-1) showed that the items of those sub-tests that were statistically significant in the Regression Analysis as predictors of the dependent variable vocabulary were rated, Generalization .855 and .846 (KR-20 and KR-21), Application .810 and .802, Memorization .800 and .757, Context B .636 and .612, Dictionary .833 and .864, and Identification .677 and .620 and Context A .494 and .527. These data reflected the reliability coefficient for the variables that developed significance in the regression prediction.

The criterion validity was determined through the calculation of the Pearson-r correlation coefficients mentioned earlier in the chapter. For the variables that attained significance in the the regression prediction only Context A was negatively correlated with vocabulary and it was also negatively correlated with Application, Comprehension and Total reading score. Table D-2 furnished these data.

One interesting note about the correlation coefficients was that Vocabulary was correlated with Total reading score .95598 while

Comprehension was correlated with Total reading score .92567. This tends to establish validity not only for the sub-tests as measurements of vocabulary it also provides validity for the Nelson-Denny Reading Test vocabulary section as a valid vocabulary indicator for these students. The listing below relates the coefficients of correlation of the variables that emerged significant predictors of the vocabulary dependent variable scores on both the total overall (N = 72) analysis and the by-Group analysis. Generalization and Memorization had a correlation coefficient of .72053, .71228 and .68679, respectively. In the by-Group analysis, the Group II variables of significance, Context B and Dictionary, each for the entire sample had a correlation coefficient of .57812 and .63280, respectively with the variable Vocabulary. For Group III, Context A was the new variable of significance and it had correlation coefficient of -.019933. For Group IV Dictionary and Identification were the new variables of significance and they had .63280 and .43956 correlation coefficients, respectively. Thus, with the exception of Context A, with its negative correlation coefficient and Identification with a coefficient of .43956, all of the other variables were correlated with vocabulary with coefficients of more than .50.

Instructions Study

In addressing the hypotheses, Ho: The instructions of the "CPD Diagnosis" have no effect on the student's performance on the seven sub-tests, a One Way MANOVA was conducted and the results of the Pillai's Trace (Bartlett, 1939, Pillai,1960) are reported in Table 8.

TABLE 8

MANOVA TEST CRITERIA FOR THE HYPOTHESIS OF
NO OVERALL TREATMENT EFFECT

H = Type IV SS & CP Matrix:	Overall Treatment Effect	Pillai's Trace
E = Error SS & CP Matrix		V = TR(H*INV(H+E))
P = Dep. Variable = 7		= 1.17879724
Q = Hypothesis DF = 7		F = (21,90) = 2.77
NE = DF of E = 34		Prob > F = 0.0003
S = Min(PQ) = 3		
M = .5(ABS(P-Q)-1) = 1.5		
N = .5(NE-P-1) = 13.0		

The hypothesis of no difference between student's performances on the seven sub-tests as a result of changing the instruction was rejected.

Three of the seven sub-tests were significant, Context B, (with sentences) $F = 3.72$, Prob. $> F = .0204$, Generalization, $F = 8.51$, Prob. $> F = .0002$, and Dictionary, $F = 12.58$, Prob. $> F = .0001$. This indicates that for those three variables there were differences between groups based on the different form of the instructions used with the respective groups. The Duncan's Multiple Range Test was carried out for the purpose of locating the differences between groups on those variables demonstrating statistical significance. The Duncan's Multiple Range Test data are presented in Table 9.

For "Context B," Treatment (1) was different from treatments 3 and 4, but not 2. The "read-along" instructions, Treatment (2), the altered instructions, Treatment (3) and the altered instructions with the "read-along" taped instructions, Treatment (4) did not differ from one another.

For "Generalization," Treatment 1 was different from treatment 2. Treatment 2 was not different from 1 or 3. Treatment 4 was different from all the others.

For "Dictionary," the altered array of the instructions was the only treatment to demonstrate differences from the other treatments.

None of the other sub-tests produced any differences for treatment group on the Duncan's Multiple Range Test.

The results of this experiment added information about the validity of the sub-tests for the purpose of assessing vocabulary strategy

TABLE 9

DUNCAN'S MULTIPLE RANGE TEST
OF SIGNIFICANT VARIABLES FOR THE VALIDATION EXPERIMENT

Context B — p .05

Mean	Grouping	N	Treat	Results
8.636364	a	11	1	1 3 & 4
7.615000	ab	8	2	2 = 3 & 4
7.090909	b	11	3	1 = 2
7.000000	b	8	4	

Generalization

Mean	Grouping	N	Treat	Results
11.818182	a	11	1	1 = 2, 1 ≠ 3 or 4
8.750000	ab	8	2	2 = 3, 2 ≠ 4
8.000000	b	8	3	
4.727273	c	11	4	

Dictionary

11.000000	a	8	2	2 = 1 = 4
9.818182	a	11	1	3 ≠ 1, 2, 4
7.500000	a	8	4	
2.545455	b	11	3	

efficiency. They indicated that the instructions cued the success of the performance of the tasks of assigning meaning to words in difficult context for 1) Context B, 2) Generalization and 3) Dictionary.

These results combined with the KR-20, 21 (Appendix D, Table D-1) Pearson-r (Appendix D, Table D-2) Regression Stepwise Maximum-R-Square, the ANOVA results support the validity of the sub-tests in gathering the description of behavior needed to build adequate teaching models for vocabulary instruction of adult students.

Summary of Reliability and Validity Data

Reliability and validity of the "CPD" Diagnosis were determined for these groups and the data furnished in Table D-1 and D-2, Appendix D. The Reliability of the items was measured with PROC ITEM (Smith 1981). This procedure assesses the inter item reliability by applying two commonly used formulas, the KR-20 and its conservative counterpart the KR-21. Both of these data were furnished in Table D-1, Appendix D. This criteria determined the reliability, with the exception of Context A, to be of at least medium reliability. The establishment of criterion validity was done through use of the vocabulary, comprehension and total reading scores of the Nelson-Denny Reading Test and the seven sub-test scores as factors in the Pearson-r coefficients of correlation.

The results of the Pearson-r showed that Context A was negatively correlated with the vocabulary, comprehension and reading scores, (Table D-2, Appendix D) and that the scores of these students (N = 72) on that variable never exceeded a .15 correlation with any of the other variables. Identification, similarly, was very low in correlation with

the other variables. Memorization, Generalization and Dictionary, however, were much higher in correlational value with the other variables, especially, Vocabulary. Context B was correlated .71 with vocabulary as well.

The procedure of using these sub-tests to assess the students' mean vocabulary performance has yielded valuable information. The implications and conclusions about this information as well as recommendations for future research were discussed more thoroughly in Chapter V.

CHAPTER V

SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Summary

The investigation in this report was an attempt to fit research on curriculum content in the area of vocabulary teaching for adults into the process-product descriptive, correlations, experimental research loop described by Gage and Giaconia (1981). They described a three stage set of experiments involved in teaching.

> The new experiments on teaching practices have two major characteristics that distinguish them from their predecessors. First, they have been based on the findings of process-product correlational studies. In the past, experiments have often been based on so-called theory. . . . Or the experiments have been based on some educational ideology, such as progressivism or open education . . . or traditionalism and formal teaching. . . . These experiments have looked at what classroom processes have been correlated positively or negatively with those products of schooling. . . . The second major distinguishing characteristic of the new experiments on teaching is that their authors have determined, through observation in classrooms, the degree to which the training of teachers had its intended effects on the teachers' actual behavior.

> ". . . The results of the first stage throw light on the effectiveness of teacher training programs in influencing teaching behavior, practices, styles, strategies, or whatever." (Gage and Giaconia, 1981, pp. 2-4)

The investigation reported here was primarily concerned with the first and second stages of the experimental loop. It attempted to provide first a description of vocabulary acquisition knowledge of four groups of students in different positions along a career ladder in the Allied Health Professions and second to correlate those data with the performance of those same students on a vocabulary achievement measure.

The use of a published diagnostic test, the "CPD" Diagnosis was an effort to expand on the descriptive research currently available in the area of vocabulary acquisition strategy use for adults. Boettcher (1979) used an interview process to ascertain the strategies used by two students, one a novice and the other an advanced student. Brown (1981) further reported metacognitive experiments with promising results that taught strategies used by expert students to novices. The four groups in this investigation represented four stages from novice to expert in the use and knowledge of vocabulary.

The correlational process employed a regression analysis to describe how the 72 students in the overall group and small individual groups performed on each of the sub-tests and how these correlated with their vocabulary scores on the Nelson-Denny Reading Test Vocabulary section (Brown, 1973, 1980).

This report attempts to describe those factors of vocabulary acquisition strategies predicted by a Maximum R^2 Improvement Regression Model for an entire sample of 72 students and for the four groups of 18 students each. It was designed to help define which vocabulary strategies should be taught to low level vocabulary students to help them most quickly develop better skills. Since these description and correlations are only descriptive, it remains for experiments to determine if, in fact, teaching the strategies that emerged from this investigation will improve and hasten vocabulary learning. The results described here are only associational.

Regression

A regression analysis allows one to test statistically which variables were most related with one another. In this investigation the regression analysis allowed the investigator to compare how each of the seven sub-tests of the "CPD" Diagnosis, Context A, synonyms only; Context B, enclosing the target words in sentences; Memorization of word parts information; Identification of word part information; Application of word part information; Generalization of word parts information; and Dictionary could predict the standardized reading test vocabulary section score.

There were two hypotheses tested in the regression analysis portion of the investigation. 1) There is no model of the seven sub-test variables that will combine to predict the Nelson-Denny Reading Test Vocabulary section score for all 72 participating students in the study. 2) There is no model by-group that will predict the Nelson-Denny Reading Test Vocabulary section score as a combination of the seven sub-test variables on the "CPD" Diagnosis.

These two hypotheses were both rejected. For the overall (N = 72) accounting for nearly 70% of the error variance in the dependent variable, vocabulary scores, Generalization, Application, Memorization and Context A demonstrated significance some time during the model development (Table 1). For each group the situation was slightly different. For Group I there was no model developed and the hypothesis was not rejected. For Group II the model contained only Context B and Dictionary at significant levels and was associated with approximately 52% of the variance in the dependent variable. For Group III the hypothesis was rejected and Application, Context A and Context B were associated with approximately 64% of the variance. For Group IV, Dictionary, Application, and Identification were the significant variables associated with approximately 85% of the variance. Tables 2, 3 and 4 reflect those data.

ANOVA

An Analysis of Variance allows one to investigate significant differences between variables. A two-way ANOVA, such as the one used in this study, allowed the investigator to compare the sub-test scores and the reading test vocabulary score for the four Quartiles of each Group's membership. It allowed examination of possible interaction between Quartile and Group membership for each variable. It then allowed examination of differences between Groups and differences between Quartiles across Groups for the entire population sample.

Three hypotheses were tested on the two-way Analysis of Variance. There is no interaction on any variable between Group and Quartile. There are no differences between performances of any Group on any of the

sub-test variables. There are no differences between performance of any Quartile across Groups on any of the sub-test variables.

The results of these tests showed that there was an interaction between Quartile membership on the Nelson-Denny Reading Test Vocabulary section and Dictionary. This result meant that at least one of the Groups was not in the right order from Quartile 1 to Quartile 4, proceeding from Group I to Group IV. Explanation of Table 6 for Dictionary and Table 7 for the other variables. Most often the result appeared similar to the Group result that Quartile 1 and Quartile 2 across all four Groups did not differ from each other, but that they did differ from Quartile 3 and Quartile 4, which also did not differ from one another. In Dictionary only Quartile 3 was not significant.

Summary of the Reliability and Validity Results

In addition to the regression analysis and the Analysis of Variance, it was necessary to develop the correlation coefficients to demonstrate if there was any criterion validity (Pearson-r correlation coefficients) to the seven sub-tests as measures of vocabulary acquisition strategies. It was also important to determine if there was any internal consistency (KR-20) to the items in the seven sub-tests themselves. For these purposes the Pearson-r correlation coefficients were developed and the KR-20 and KR-21 formulas were applied. Those results (Appendix D, Tables 1 and 2) are briefly summarized below.

The Pearson-r correlation coefficients indicated how the error variance on one variable was related to the error variance on each of the other variables. When the Pearson-r is squared there is an indication of the amount of error variance the one score has in

association with the score against which it was being correlated. Table D-2 furnished the information on the Pearson-r for these data. The regression analysis accounted for the amount of variance in the R^2 Improvement reported for each of Tables 1, 2, 3 and 4. For the overall significant variables on the regression analysis Context A, Memorization, Application and Generalization had coefficients of -.09933, .68679, .71228, and .72053 respectively when correlated with the Nelson-Denny Reading Test Vocabulary section scores. In the by-Group regression analysis, no variables were significant for Group I. The variables significant for Group II were Context B, and Dictionary. They were related to the vocabulary score .58712 and .63280, respectively. For Group III the significant variables were Context A, Context B, and Application. They were correlated with vocabulary .69933, .58712, and .71228, respectively. For Group IV the significant variables were Dictionary, Application and Identification. They were correlated with vocabulary, .63280, .71228 and .43956, respectively. With the exception of the negative correlation of Context A and the .43956 correlation of Identification all of the other Pearson-r coefficients were correlated with vocabulary exceeding .50. In addition to these data, Reliability was also assessed using a program that yielded to estimates of reliability of the items on the sub-tests.

While criterion validity was established for these data using the Pearson-r correlation coefficient and regression analysis data, inter item reliability for all of the sub-tests needed to be established. In order to suggest that results are valid for any group of data it is necessary to determine if those results are in fact reliable. To accomplish this the KR-20 and KR-21 formulas (Richardson, M.W. & Kudder,

G.F., 1939) as interpreted by the computer programs (Smith, D., 1981) were used (Appendix D, Table D-1).

The reliability coefficients figured by each formula (KR-20 and KR-21) yielded a slightly different coefficient. However, the ratio of reliability of the items remained the same or similar using the two formulas. For the overall model the KR-20 and the KR-21 values were Context A, .494 and .527, Memorization, .800 and .757, Application, .810 and .802, and Generalization, .855 and .846. With the exception of Context A all of the variables that were significant in the regression analysis had coefficients of more than .75 for item difficulty consistency. For the by-group analyses Context B and Dictionary were the significant variables for Group II. Their reliability coefficients were .636 and .612, for Context B, and .833 and .864 for Dictionary. For Group III, Application, Context A and Context B were the significant variables. Their reliability coefficients were, for Application .810 and .802, for Context A, .494 and .527 and for Context B, .636 and .612. For Group IV Dictionary, Application and Identification were the significant variables. Their reliability coefficients were, Dictionary, .833 and .864, Application, .810 and .802, and Identification, .677 and .620.

Only Context A, Context B and Identification yielded reliability coefficients of less than .75. This result tended to document the reliability of the scores for the population samples that participated in the study.

In addition to calculating the Pearson-r, the R^2 Improvement, and the KR-20 and KR-21, a small experimental study was conducted to determine if the instructions that accompanied the "CPD" Diagnostic

sub-tests could cue the students to the specific tasks required by the sub-tests. Three of the seven sub-tests, Context B, Generalization, and Dictionary, demonstrated that they were influenced by the instructions included by the author. These sub-test variables were also significant in the regression analysis in the principal study and in the following ANOVA analyses.

The final results of the validity and reliability studies were reported on a small experimental study using the instructions that accompanied the sub-tests in several different forms to see if the instructions themselves would cue students to the expected tasks. Four groups of high-school students demonstrated that the instructions did cue the tasks as measured by a Multiple Analysis of Variance and Duncan Multiple Range Test follow-up procedures (Tables 8-9).

Conclusions

Following the collection of the data, the application of the regression analysis formulas, the Analyses of Variance and the development of the reliability and validity data, several conclusions were possible. The conclusions were all associational and form the basis for future experiments in the three stage loop as described by Gage and Giaconia (1981).

The first conclusion based on the overall data was that using the statistical procedures of this study it was possible to describe a set of variables related to good vocabulary performance for a large group of students along a career ladder. These types of comparisons would not be possible on a large scale if techniques of securing information such as the self-report case studies accompanied by indepth interviews as

Boettcher (1979) were the only means of securing descriptive information. The current investigation partially validated objective data gathering for descriptive purposes. Thus, from these data it was suggested that the use of diagnostic instruments designed for vocabulary improvement of the highest group assessed may yield adequate data in relation to vocabulary achievement to secure empirically derived variables upon which to base controlled vocabulary experiments.

The results generated by the group data regression and ANOVA analyses led to the second conclusions. They tended to confirm what Marshall and Glock(1978) and Boettcher (1979) found, i.e. that two-year college students do process information differently than four-year college students or graduate students. In this investigation, Group III, two-year college students, demonstrated that Context A, (Knowledge of synonyms), Context B, (use of sentences as redundant information), and Application of word part rules information, were the significant predictors of their standardized vocabulary scores. For the students in Group IV, graduate students, Identification of word parts, and Dictionary were the factors that were significant in predicting their standardized vocabulary scores. Thus, it could be concluded that these two groups did employ different processes. Another interesting result was that Group II, and by inference Group I, shared only one factor with Group III (Context B) and one factor with Group IV (Dictionary). Those are the only two sub-tests that don't require knowledge of word-part information. Based on these results, it could be concluded that the standardized vocabulary scores for Groups I and II were not related to the word-part sub-tests scores.

Although no model of significant variables was generated by the regression analysis to predict the vocabulary scores of the students in Group I, using the ANOVA and the follow-up Tukey procedure analysis it was possible to infer a model similar to that of Group II. An inspection of Tables 6 and 7, however, showed that this fit was not exact in all aspects, as Quartiles 1-4 and 2-4 were significantly different for Dictionary, the variable shared with Group IV.

The third conclusion was that on the basis of the Quartile results it would appear that there were two halves for each level of class no matter whether the group was barely entry level such as Group I and Group II, with minimum vocabulary skills or whether the group was preparing for professional or post-professional levels of employment. quartile membership within any group seemed to carry with it certain performance characteristics on the sub-tests that were reflected across all four groups. For most of the variables Quartile I and Quartile 2 were separated from Quartile III and Quartile IV.

Quartile 1 across all groups maintained significance lower than Quartile 2 sufficient to suggest special needs be investigated for Quartile 1 in any group. Quartile 3, in Dictionary, demonstrated no differences across groups perhaps suggesting that for that variable students in all groups in this Quartile are at an integrating plateau across all the groups. Thus these data lead to the conclusion that the Quartile factor is of significant interest for further investigation.

The final conclusion reinforced O'Connor's (1948) findings that vocabulary was the most closely correlated factor with success for executives. From the results of the present study (Table D-2) it may be

concluded that vocabulary was more highly correlated with total reading achievement score than was comprehension.

Based on these results, it could be concluded that the standardized vocabulary scores for Groups I and II were not related to the word part knowledge sub-test scores. It also demonstrated that there was a similarity between these students and the two-year college student in the Boettcher (1979) who employed paragraph restatement frequently as a device in assigning meaning. Context B, and Dictionary are search strategies rather than specific knowledge application strategies. It is assumed by most readers that there is some redundancy of information included in the sentence surrounding an unknown word. It is further assumed that such redundancy may be included in the dictionary entry concerning the word to enable separation of one meaning in the list from another.

For Group I and Group II there were no differences on the performance of Context B. However for Dictionary, there was a significant difference between the students in Group I and Group II on Quartile 4. Therefore, it can not be said that the model for II was an exact fit for Group I.

Implications

The first implication from the conclusions is that complex research studies on the knowledge of vocabulary development for adult students are possible because of computer programs that enable large amounts of data to be processed rapidly. This implication has ramifications for repeating this investigation with several other discipline cross sections and compiling a new volume similar to Petty, Herrold and Stoll

(1968). Other interested investigators could obtain the data necessary to determine which of the factors predicted on the basis of correlational regression analyses and their analysis of variance follow-ups were most effective in efficient vocabulary learning.

The next implication of this research centered around the aspects of building teaching materials on the correlational results that emerge from controlled teaching experiments. These experimental results would yield teaching materials based on factors correlationally validated. They will not be based on ideologies or theories that someone thought were appropriate for instruction, but will instead be based on what has been empirically observed and statically verified.

It was possible to account for 70% of the variance in the dependent vocabulary score on the basis of the model for the overall population sample. Those variables, Context A, Generalization, Application and Memorization of word parts should now form the basis of a set of experimental vocabulary materials. Another possible combination of variables for experimentation would be using the group significant factors. Teaching experiments could be so constructed as to include teacher training to deal differently also with the Quartile significant factors in the experimental class and to refrain from any change in the control classroom. These experiments would be based on the validated combinations of variables emerging from the data in this investigation. This type of experiment could be used to determine if differences, combination of teaching variables in vocabulary acquisition strategies as described in this investigation, would enchance the learning of vocabulary and the vocabulary achievement scores of the Quartile 1 and 2 students across groups and for Groups I and II students in general.

On the basis of the results generated by these data, controlled experiments need to be instituted to determine what constitutes adequate instruction in vocabulary to meet the needs of each of the Quartiles within Groups I, II, III or IV. The salvaging of many potentially valuable workers in any career discipline may well depend on how those workers process learning of vocabulary.

Summary

The structure of this investigation, the Group-to-Quartile research model appeared to furnish a valid procedure to describe knowledge of those vocabulary acquisition strategies necessary for successful functioning in a vocational or technical curriculum. The next steps should be taken to close the experimental research loop and then to disseminate the new information gained from these experiments in an updating of Petty, Herrold and Stoll (1968).

Conclusions, Implications, and Recommendations

Based on the summary of data above the following conclusions, implications and recommendations could be drawn.

1) It was possible to describe the working vocabulary strategies used by vocational or technical students enrolled in different programs along a career ladder using the approach employed in this investigation. The results of a standardized assessment of vocabulary achievement, The Nelson-Denny Reading Test vocabulary section, and an in class vocabulary diagnostic test, produced two sets of scores that when submitted to regression analyses determined a set of diagnostic variables that could

significantly predict mean vocabulary achievement scores for the group as a whole (Table 1).

2) It was possible to describe the working vocabulary strategies of four individual groups of students at different points along a career ladder. Groups II, III, and IV developed diagnostic variable lists that were significant predictors of that group's vocabulary score (Tables 2, 3 and 4).

3) It was possible to suggest but not predict a model for Group I from the ANOVA follow-up of the regression analysis. However, because of the differences between Groups I and II on Dictionary, the model was not an exact fit. More needs to be learned about the procedures used in vocabulary instruction for Groups I and II. These appeared similar in population and in instructional content. The Nelson-Denny Reading Test vocabulary section (Table 5) indicated similar vocabulary performance scores. The regression analysis failure to develop a model with significance for Group I had to be based on Group I's performance on the sub-test variables. From these data there are no clues, other than, Tables C-1 - C-7, the mean tables for each of the sub-test variables. Further investigation, probably beginning with classroom observation, needs to be carried out to determine why two programs with essentially the same types of students would project the discrepancies found in these data.

4) It was further concluded that this procedure, based on the results of the KR-20, KR-21 and the Pearson-r correlational formula applications, was reliable and valid for conducting the first two stages of the three stage research loop as described by Gage and Giaconia (1981).

It is recommended that other investigations on vocabulary acquisition be carried out assessing different career ladder students in training and in the field. Since a great deal of vocabulary training takes place at the beginning levels of any discipline area careful attention should be given to the description of the skills or strategies used by successful students. These research results describing ways of assigning correct meaning to vocabulary in unfamiliar technical contexts by experts or successful students rather than ideas or theories can and should now guide our experiments and instructional content building in the area of vocabulary (Tables 6 and 7).

Beyond these conclusions from the variables predicted in the regression analysis, several recommendations for further research emerged. Overall, Context A, Memorization, Application and Generalization of word part information were significant predictors of vocabulary score performance. This fact suggests that knowledge about synonyms, non-context related; knowing sets of word part rules, application of those rules and generalizations from those rules were the over all predictors of good or poor scores on the criterion vocabulary test. A logical next step in the research loop would be to fashion controlled experiments to assess their causal productivity. The by-quartile results were most interesting in their refined description of the within class performance dynamics across all the groups.

The conclusions based on the evidence accumulated through the correlational analyses in this investigation were associational, but indicated high validity and reliability. The implications for further research and curriculum development rest on that validity and reliability. The importance of vocabulary instruction at all levels of

vocational training has long been recognized. The results and conclusions of this study will contribute toward making that instruction far more efficient as it becomes more research based.

APPENDIX A

THE DIAGNOSTIC TEST FOR THE CPD APPROACH PROGRAMMED VOCABULARY THIRD EDITION

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PROGRAMMED VOCABULARY THIRD EDITION

The following diagnostic test will answer three key questions:

I. CONTEXT: How well do you use the context to get word meanings?

II. PARTS: How well do you use word parts--prefixes, roots, and suffixes--to get word meanings?

A. Memorization
B. Identification
C. Application
D. Generalization

(Four-part in-depth exploration)

Parts Score Total

III. DICTIONARY: How well do you use the dictionary to get accurate information about words and word parts?

A word of warning: The following tests are all quite difficult. That's so you can see progress more clearly. After all, if you score 100 percent to begin with, what further progress can you possibly see? Any frustration you feel now--and you'll probably feel far too much--should be more than compensated for by your greatly improved performance when you finish this text, after an estimated twelve to sixteen hours of work. In a sense, the lower your scores now, the better. The more

room you have for improvement, the more important this book, and the greater its challenge.

Do the following tests without looking up any of the answers. You want to know which of these three areas needs most attention--which area you should concentrate on for maximum improvement.

Do not check any answers until you have finished the entire test.

I. Context Test

When you meet a strange word, how well do you use contextual clues to get its meaning? Let's find out. We'll use a two-step procedure. First you'll take a vocabulary test--ten items without any context to help. Then you'll take the same test, but this time you'll have contexts to use.

Now take the following ten-item vocabulary test, putting your answers in the column headed A. It's intended to be so difficult you may not get even one right, for if you already know the words, you don't need contextual help. And the important thing here is to find out how well you use context. So--go right ahead. Answer <u>all</u> ten items. Then continue as directed below.

		A	B
1.	Refectory means (1) kitchen; (2) mirror; (3) dining room; (4) washroom; (5) living room.	1. _____	_____
2.	Preferment means (1) burial; (2) precedent; (3) sickness; (4) advancement; (5) choice.	2. _____	_____
3.	Canaille means (1) mob; (2) dog hospital; (3) visitors; (4) soldiers; (5) students.	3. _____	_____
4.	Glabrous means (1) large; (2) bald; (3) sharp; (4) icy; (5) glamorous.	4. _____	_____

		A	B
5.	Capriole means (1) whim; (2) leap; (3) trot; (4) flourish; (5) rest.	5. _____	_____
6.	Halcyon means (1) brilliant; (2) memorable; (3) clear; (4) tranquil; (5) ecstatic.	6. _____	_____
7.	Mephitic means (1) intoxicating; (2) soothing; (3) harmful; (4) methodical; (5) healthful.	7. _____	_____
8.	Epergne means (1) centerpiece; (2) antique; (3) sword; (4) classical poem; (5) salad.	8. _____	_____
9.	Abecedarian means (1) expert; (2) grammarian; (3) stranger; (4) beginner; (5) teacher.	9. _____	_____
10.	Mawkish means (1) fumbling; (2) sickening; (3) awkward; (4) droll; (5) colorful.	10. _____	_____

Now for the second step. Here are sentence contexts for each of the above ten words. Study each; then go back to the test item and enter the answer that seems to fit the context best. Use column B for this second set of answers. Don't change any answers in column A. Sometimes, of course, you may have the same answer in both columns.

1. Sometimes the helper worked inside, sweeping crumbs off the refectory floor from around the tables.

2. If you want preferment, work so hard you'll stand out above all others.

3. The unruly, shouting canaille burst into the palace, smashing down the doors.

4. As he walked, his glabrous head reflected the street lights.

5. The spectators watched the horse execute a perfectly timed capriole.

6. Their restful vacations in the mountain solitudes brought them halcyon days.

7. A stupifying mephitic gas came pouring out of a vent into the crowded room, leading to serious consequences.

8. As they entered the dining room, they saw the beautiful epergne on the table.

9. Well, you've had years of skiing experience. I'm just an abecedarian.

10. The movie was so mawkish, we left in the middle--just couldn't stand any more!

Now you should have two complete sets of answers. Score them as directed below after you have completed this entire three-part diagnostic test.

Give yourself ten for each one right, scoring each set separately. If you made perfect use of context, you will score 100 in column B. The difference between your scores with and without context indicates how well you use contextual clues.

Your score for this part, therefore, is your column B score minus your column A score. If, however, your score in column A is 50 or more, multiply your column B minus column A score by two to get your context score.

II. Parts Test

II A: Memorization

To measure your skill in using word parts, you need four tests, not one, for skillful use of word parts depends on four separate insights or skills. As with your fingerprints, your score on these subtests will carry your individual mark. You may do very well in one area, very poorly in another. But, when you have finished all four subtests, you will know exactly where to concentrate your attention to get the best results. You will know exactly what strengths to build on and what weaknesses to correct.

This first subtest of word parts measures your rote knowledge of the common meanings of ten prefixes and ten roots, an indication of your awareness of all such elements.

Again, this is a difficult test. You will probably have to guess frequently. Be sure to get an answer down for each item, even if you are not sure of its meaning. Obviously if you do not know what a given prefix or root means, you cannot use it as a shortcut. And since each element helps you with close to a thousand words, you can hardly afford not to know and use them as shortcuts to word meaning.

To broaden the measure of your prefix and root knowledge, the following word-part tests contain some prefixes and roots not included in the fourteen words to be studied in depth. This is so that when you finish the text you can see more clearly what progress you've made. If you develop superior ability, you'll be able to deal accurately with elements studied in depth as well as with many others.

Test II A

Memorization

1. Re- means (1) together; (2) upon; (3) back or again; (4) behind; (5) out of. 1. _____

2. Mono- means (1) some; (2) now; (3) still; (4) alone; (5) almost. 2. _____

3. Sub- means (1) beside; (2) apart from; (3) out; (4) under; (5) in front of. 3. _____

4. Mis- means (1) wrong; (2) cruel; (3) different; (4) late; (5) old. 4. _____

5. Com- means (1) every; (2) through; (3) after; (4) together; (5) in. 5. _____

6. Ad- means (1) for; (2) with; (3) to or toward; (4) from; (5) only or without. 6. _____

7. Inter- means (1) inside; (2) between; (3) near; (4) forward; (5) among. 7. _____

8. Ab- means (1) bad; (2) take out; (3) below; (4) away from; (5) not. 8. _____

9. Pro- means (1) together with; (2) to go; (3) behind; (4) forward; (5) outside. 9. _____

10. Para- means (1) more; (2) beginning; (3) present; (4) past; (5) beside. 10. _____

11. Scribere means (1) write; (2) stretch; (3) speak; (4) scratch; (5) frighten. 11. _____

12. Videre means (1) eat; (2) catch; (3) value; (4) shake; (5) see. 12. _____

13. Ferre means (1) bear or carry; (2) float; (3) rust; (4) put or place; (5) enter. 13. _____

14. Facere means (1) put; (2) fear; (3) make; (4) fill; (5) lead. 14. _____

15. Sequi means (1) decorate; (2) quiet; (3) cure; (4) follow; (5) preach. 15. _____

16. Logos (legein) means (1) speech or science; (2) locate or find; (3) raise; (4) limit; (5) leave. 16. _____

17. Vertere means (1) turn; (2) speak; (3) inform; (4) watch; (5) voyage. 17. _____

18. Mittere means (1) send; (2) catch; (3) release; (4) tire; (5) earn. 18. _____

19. Sedere means (1) cut off; (2) speak; (3) sit; (4) select; (5) satisfy. 19. _____

20. Claudere means (1) climb; (2) divide; (3) clean; (4) eliminate; (5) shut. 20. _____

II B: Identification

This second subtest of word parts measures your ability to identify prefixes and roots as they normally appear in words. You must know, for example, that every word beginning with pre does not

contain the prefix pre-. The prefix pre- is in prefer but not in pretzel. The prefix ad- is in admit but not in adynamic. In short, if a given word begins with the exact letters of any prefix, it still may or may not contain that prefix.

Root elements pose the same kind of problem. The roots mitt and miss may look quite different, yet the English words admitting and admission suggest that they are but different forms of the same root.

Obviously, to take full advantage of prefixes and roots as shortcuts you must be able to make such distinctions. This subtest provides a measure of that ability. The remainder of the book provides help so that you become skilled in making those distinctions.

Don't worry about mistakes. If you have no trouble with this test, you know the book is too elementary for you. Only when you try something beyond present mastery do you grow. An easy book is anti-growth. You want your work to bring real improvement.

Test II B

Identification

1. Monopoly contains a form of (1) homo-; (2) multi-; (3) non-; (4) mono-; (5) none of the preceding prefixes. 1. _____

2. Correlation contains a form of (1) contra-; (2) circum-; (3) re-; (4) ab-; (5) none of the preceding prefixes. 2. _____

3. Suppress contains a form of (1) super-; (2) supra-; (3) pre-; (4) sub; (5) none of the preceding prefixes. 3. _____

4. Misnomer contains a form of (1) iso-; (2) mid-; (3) mini-; (4) mis-; (5) none of the preceding prefixes. 4. _____

5. Collaborate contains a form of (1) com-; (2) counter-; (3) contra-; (4) ab-; (5) none of the preceding prefixes. 5. _____

6. Adder contains a form of (1) ana-; (2) ad-; (3) amphi-; (4) de-; (5) none of the preceding prefixes. 6. _____

7. Intercept contains a form of (1) in-; (2) intro-; (3) ex-; (4) inter-; (5) none of the preceding prefixes. 7. _____

8. Aversion contains a form of (1) ab-; (2) aut-; (3) ana-; (4) ex-; (5) none of the preceding prefixes. 8. _____

9. Reproduce contains a form of (1) retro-; (2) pro-; (3) ob-; (4) post; (5) none of the preceding prefixes. 9. _____

10. Parallel contains a form of (1) pan-; (2) pyro-; (3) para-; (4) ad-; (5) none of the preceding prefixes. 10. _____

11. The word nondescript contains a form of (1) densus; (2) crescere; (3) stringere; (4) ducere; (5) none of the preceding roots. 11. _____

12. Video contains a form of (1) videre; (2) vincere; (3) volvere; (4) verus; (5) none of the preceding roots. 12. _____

13. Feature contains a form of (1) ferre; (2) forma; (3) fundere; (4) fluere; (5) none of the preceding roots. 13. _____

14. Factory contains a form of (1) actus; (2) facere; (3) capere; (4) agere; (5) none of the preceding roots. 14. _____

15. Sequel contains a form of (1) quaerere; (2) sequi; (3) equitare; (4) sentire; (5) none of the preceding roots. 15. _____

16. Sociology contains a form of (1) senex; (2) logos; (3) ludere; (4) cito; (5) none of the preceding roots. 16. _____

17. Versatile contains a form of (1) vertere; (2) satiare; (3) venire; (4) jacere; (5) none of the preceding roots. 17. _____

18. Admission contains a form of (1) addere; (2) dicere; (3) mutare; (4) mittere; (5) none of the preceding roots. 18. _____

19. Sediment probably contains a form of (1) sedere; (2) sentire; (3) dicere; (4) edere; (5) none of the preceding roots. 19. _____

20. Include probably contains a form of (1) caput; (2) clinare; (3) ludere; (4) claudere; (5) none of the preceding roots. 20. _____

II C: Application

This third subtest measures the important payoff step. You may know what a prefix or root means (memorization) and may be able to identify the element correctly in a word (identification), but how well can you apply that information to unlock word meanings? This subtest provides a measure of your skill in application. You may score perfectly in the first two tests but still have difficulty here. These difficult words all have prefixes or roots which should be of help--if you have developed sufficient skill in putting them to use.

Test II C

Application

1. Relumed means (1) lighted again; (2) torn into bits; (3) filled up; (4) brightened; (5) lined up. 1. _____

2. Monostich means (1) headache; (2) catalog; (3) radio; (4) line of poetry; (5) lining. 2. _____

3. Sublunary means (1) luminous; (2) oval; (3) solar; (4) unreasoning; (5) earthly. 3. _____

4. Miscreant means (1) dramatist; (2) executive; (3) speaker; (4) heretic; (5) warrior. 4. _____

5. Compendium means (1) summary; (2) pencil; (3) pretense; (4) extension; (5) discarding. 5. _____

6. Adminicular means (1) retiring; (2) small; (3) broken down; (4) strange; (5) helping. 6. _____

7. Interlope means (1) elude; (2) chase; (3) intrude; (4) modify; (5) limp. 7. _____

8. Aberrant means (1) inclusive; (2) relevant; (3) tired; (4) deviating; (5) sane. 8. _____

9. Prolocutor means (1) spouse; (2) spokesman; (3) orator; (4) plan; (5) typist. 9. _____

10. Paradigm means (1) falsehood; (2) model; (3) exception; (4) eruption; (5) problem. 10. _____

11. Escritoire means (1) writing desk; (2) raven; (3) drinking fountain; (4) paper; (5) bank. 11. _____

12. Vis-à-vis means (1) back to back; (2) new; (3) alike; (4) face to face; (5) side by side. 12. _____

13. Feracious means (1) fierce; (2) gentle; (3) solid; (4) barren; (5) fruitful. 13. _____

14. Facile means (1) skillful; (2) struggling; (3) conservative; (4) beginning; (5) deserving. 14. _____

15. Sequela means (1) remedy; (2) following thing; (3) quiz; (4) struggle; (5) big tree. 15. _____

16. Logogriph means (1) wooden peg; (2) gun; (3) container; (4) word puzzle; (5) handle. 16. _____

17. Divert means (1) remove; (2) turn aside; (3) make ready; (4) display; (5) remain. 17. _____

18. Missive means (1) mask; (2) message; (3) star; (4) question; (5) weapon. 18. _____

19. Sedate means (1) worldly; (2) composed; (3) religious; (4) secretive; (5) slovenly. 19. _____

20. Claustral means (1) fatty; (2) harmful; (3) confined; (4) clear; (5) stormy. 20. _____

II D: Generalization

Every day you must rely on generalizations about people and things. When you taste three green, hard apples and discover all of them are sour, you generalize that <u>all</u> green, hard apples are sour. Obviously, generalizing is a very useful ability to cultivate.

If you can sharpen your ability to generalize accurately about words and word parts, you can then make quantum leaps in your vocabulary development. This fourth and last subtest of word parts attempts to measure how accurately you now generalize. Again, try each item. Do not leave any answer spaces blank.

Test II D

Generalization

1. The prefix dis- is not in (1) displease; (2) indifferent; (3) diffuse; (4) distract; (5) dish. 1. _____

2. The prefix de- is not in (1) defer; (2) debar; (3) condescend; (4) decrease; (5) death. 2. _____

3. Which of the following prefixes is most likely to change in form? (1) hyper-; (2) pre-; (3) mono-; (4) com-; (5) de-. 3. _____

4. The prefix ex- is usually spelled ef- before a root beginning with (1) f, (2) g; (3) s; (4) m; (5) c. 4. _____

5. If there were a prefix rib- to be combined with port, the probable form would be (1) ripport; (2) ribport; (3) riport; (4) ribbort; (5) ribort. 5. _____

6. The most frequent variations in prefix form are found with the prefixes ending in (1) a vowel; (2) a consonant; (3) a diphthong; (4) a double vowel; (5) an m. 6. _____

7. In English words, the -ere or -are of many Latin roots is normally (1) retained; (2) changed to -er; (3) changed to -or; (4) changed to -re; (5) dropped. 7. _____

8. If you combined the imaginary prefix ud- with nex, the probable resulting form would be (1) unnex; (2) udnex; (3) uddex; (4) unex; (5) udex. 8. _____

9. Variations in original classical root elements coming over into English usually occur in what part? (1) no particular part; (2) the last part; (3) the middle part; (4) the first part. 9. _____

10. English words derived from classical sources make up about how much of our language? (1) 20%; (2) 30%; (3) 40%; (4) 50%; (5) 60%. 10. _____

11. The Latin word fluo, found in fluid and flux, probably means (1) force; (2) year; (3) flow; (4) harden; (5) file. 11. _____

12. Omni-, found in omnibus, omnipresent, and omniverous, probably means (1) solid; (2) free; (3) single; (4) old; (5) all. 12. _____

13. Fundo, found in funnel and refund, probably means (1) shape; (2) bind; (3) pour; (4) pay; (5) fall. 13. _____

14. Ardeo, found in ardor and arson, probably means (1) burn; (2) tree; (3) love; (4) cruel; (5) equal. 14. _____

15. Meta-, found in metamorphosis and metabolism probably means (1) fixed; (2) altered; (3) spoken; (4) outlined; (5) discovered. 15. _____

16. Valeo, found in valor, and invalid, probably means (1) level; (2) weak; (3) old; (4) strong; (5) colorful. 16. _____

17. Dies, found in diary and diurnal, probably means (1) book; (2) day; (3) pen; (4) year; (5) skill. 17. _____

18. Aristos, found in aristocrat, probably means (1) best; (2) ancient; (3) vain; (4) recent; (5) artistic. 18. _____

19. After thinking of some words beginning with mega-, which meaning seems best for that word part? (1) limited; (2) sure; (3) middling; (4) powerful; (5) artificial. 19. _____

20. After thinking of some words probably derived from pendeo, which meaning seems best? (1) hang; (2) judge; (3) pierce; (4) exchange; (5) feel (Did you think of pendant or pendulum?) 20. _____

III. Dictionary Test

Academically speaking, your best friend is your dictionary. It plays a key role in the CPD approach, fusing context and parts together into a dynamic vocabulary-building whole. But dictionaries

crowd so much into small space that you need to develop special skills to get accurate information.

How accurately can you now use this highly specialized aid? Take this test to find out. Use the dictionary entries below to answer the twenty questions. All questions, however, are not answered in these entries. So if the information is not there, enter a dash or the phrase, "no information" in the answer space and move on to the next item.

*ad[1](ad)n.[Colloq.]an advertisement

ad[2](ad)n. Tennis advantage (sense 4): said of the first point scored after deuce--ad in server's advantage--ad out receiver's advantage

ad-(ad, əd, id)[L. ad-, to, at, toward; akin to AT] a prefix meaning variously motion toward, addition to, nearness to [admit; adjoin; adrenal]: assimilated in words of Latin origin to ac- before c or q, af- before f, ag- before g, al- before l, an- before n, ap- before p, ar- before r, as- before s, at- before t, and a- before sc, sp, and st: many apparent English occurrences of this prefix are Latinizations, often erroneous, of French or even of English words: see ADVANCE, ADMIRAL, ACCURSED, ACKNOWLEDGE

-ad[1](ad, əd, id)[Gr. -as, -ad-] a suffix meaning of or relating to, used in forming: 1. the names of collective numerals [monad] 2. the names of some poems [Iliad] 3. the names of some plants [cycad]

-ad[2](ad)[L. ad, toward] a suffix meaning toward, in the direction of [caudad]

-ite[1](it)[ME.<OFr. or L. or Gr.: OFr. -ite<L. -ita, -ites<Gr. -ites, fem. -itis] a n.-forming suffix meaning: 1. a native, inhabitant, or citizen of [Brooklynite] 2. a descendant from or offspring of [Israelite] 3. an adherent of, believer in, or members of [laborite] 4. a product, esp. a commercially manufactured one [lucite, dynamite, vulcanite] 5. a fossil [ammonite] 6. a part of a body or bodily organ [somite] 7. [Fr., arbitrary alteration of -ate, -ATE[2]] a salt or ester of an acid whose name ends in -ous nitrite, sulfite 8. a (specified) mineral or rock anthracite, dolomite]

-ite[2](it; in some words, it)[L. -itus, ending of some past participles] a suffix used variously to form adjectives, nouns, and verbs [finite, favorite, unite]

ness (nes)n.[ME. nesse < OE. naes & ON. nes, akin to OE. nosu, NOSE] a promontory; headland; now chiefly in place names [Inverness]

-ness (nis, n s)[ME. -nesse < OE. -nes(s), akin to G. -niss, Goth. -nassus [for -assus, with n- < end of the base of weak verbs ending in -atjan)] a n.-forming suffix meaning state, quality, or instance of being [greatness, sadness, togetherness]

nice (nis)adj. nic´er, nic´est[ME., strange, lazy, foolish < OFr. nice, nisce, stupid, foolish < L. nescius, ignorant not knowing < nescire, to be ignorant < ne-, not (see NO[1]) + scire, to know: see SCIENCE] 1. difficult to please; fastidious; refined 2. delicate; precise; discriminative; subtle [a nice distinction] 3. calling for great care, accuracy, tact, etc., as in handling or discrimination [a nice problem] 4. a) able to make fine or delicate distinctions; delicately skillful; finely discriminating b) minutely accurate, as an instrument 5. having high standards of conduct; scrupulous 6. a generalized term of approval meaning variously: a) agreeable; pleasant; delightful b) attractive; pretty c) courteous and considerate d) conforming to approved social standards; respectable e) in good taste f) good; excellent 7. [Obs.] a) ignorant; foolish b) wanton c) coy; shy--adv. well, pleasingly, attractively, etc.: variously regarded as substandard, dialectal, or colloquial--SYN. see DAINTY--nice and [Colloq.] altogether, in a pleasing way [likes his tea nice and hot]--nice´ly adv.--nice´ness n.

spectator (spek´tatər, spek tat´-)n[L. < pp. of spectare, to behold: see SPECTACLE] a person who sees or watches something without taking an active part; onlooker

spec-ter (spek´tər)n.[Fr. spectre < L. spectrum, an appearance, apparition < spectare, to behold: see SPECTACLE] 1. a ghost; apparition 2. any object of fear or dread. Also, Brit. sp., spec´tre

Dictionary Diagnostic Quiz

1. In the sentence, "Picking the most appropriate definition requires some nice distinctions on your part," which of the seven numbered definitions of nice is intended? 1. Def.#_____

2. In the sentence, "That's a nice song you're singing," which numbered definition of nice is intended? 2. Def.#_____

3. In the sentence, "This is a nice mess you've gotten us into," which numbered definition of nice is intended? 3. Def.#_____

4.	In the sentence, "They're so nice in their dining habits they wouldn't think of going on a picnic," which definition of nice is intended?	4. Def.#_____
5.	In the sentence, "You showed a nice regard for their feelings at that difficult time," which definition of nice is intended?	5. Def.#_____
6.	How many different entries are there for the prefix ad?	6. _____
7.	The prefix ad means what?	7. _____
8.	Can ad also be used as a suffix? (Yes, no, or no information)	8. _____
9.	Is ad also an abbreviation? (Yes, no, or no information)	9. _____
10.	If the prefix ad were added to the word stringent, how would the resulting word be spelled?	10. _____
11.	If the prefix ad were added to the word leviate, how would the resulting word be spelled?	11. _____
12.	Nice came originally from what language?	12. _____
13.	Nice is most closely related to what language?	13. _____
14.	The Latin verb spectare means what?	14. _____
15.	What dictionary entry gives added information about spectare?	15. _____
16.	The Latin word spectrum means what?	16. _____
17.	The Latin verb scire means what?	17. _____
18.	How is ness used--as word, abbreviation, prefix, or suffix?	18. _____
19.	How many different entries are there for ite?	19. _____
20.	If you are bashful, you are in a state of bashful_____?	20. _____

APPENDIX B

INFORMATION DELETED INSTRUCTIONS

APPENDIX B

INFORMATION DELETED INSTRUCTIONS

The following alternations were made in the instructions of the seven subtests for the purpose of carrying out the experiment for the first pilot study.

(1) Context Test A: Take the following ten-item vocabulary test, putting your answers in the column headed A. It's intended to be so difficult you may not get even one right. Answer all ten items. Then continue as directed below.

(2) Context Test B: Now for the second step. Use Column B for the second set of answers. Don't change any answers in column A. Sometimes, of course, you may have the same answers in both columns.

(3) Memorization: To measure your skill in using word parts, you need four tests, not one. Test IIA also is a difficult test. You will probably have to guess frequently. Be sure to get an answer down for each item.

Don't worry about mistakes. If you have no trouble with this test, you know the book is too elementary for you. Only when you try something beyond present mastery do you grow. An easy book is antigrowth.

(4) Identification: Complete this test as you did the last two. You may have scored perfectly on them but still have difficulty here.

(5) Application: Complete this test as you did the last two. You may have scored perfectly on them but still find you have difficulty here.

(6) Generalization: For this fourth subtest again, try each item. Do not leave any spaces blank.

(7) Dictionary: You will need to use the information on these two pages from a dictionary (or that look like a dictionary) to answer the items on the next page. Complete all items. Do not leave any spaces blank.

APPENDIX C

TABLES OF MEANS AND RAW DATA

TABLE C-1

MEANS - CONTEXT A

Q	Group I	Group II	Group III	Group IV	Total
	n = 5	n = 4	n = 4	n = 4	17
1	$\bar{x}$ = 3.00	$\bar{x}$ = 3.25	$\bar{x}$ = 1.50	$\bar{x}$ = 1.75	2.41
	s = 1.224	s = 1.258	s = 2.38	s = .95	1.58
	n = 6	n = 6	n = 5	n = 5	22
2	$\bar{x}$ = 2.83	$\bar{x}$ = 3.66	$\bar{x}$ = 1.40	$\bar{x}$ = 1.60	2.45
	s = .75	s = 2.338	s = 1.140	s = 1.51	1.74
	n = 3	n = 4	n = 5	n = 5	17
3	$\bar{x}$ = 2.66	$\bar{x}$ = 4.75	$\bar{x}$ = 2.80	$\bar{x}$ = 3.00	3.29
	s = .57	s = 3.77	s = 2.049	s = 1.58	2.26
	n = 4	n = 4	n = 4	n = 4	16
4	$\bar{x}$ = 3.25	$\bar{x}$ = 3.50	$\bar{x}$ = 3.00	$\bar{x}$ = 2.75	3.16
	s = .95	s = 3.109	s = 2.82	s = 2.50	2.25
	18	18	18	18	
	2.94	3.77	2.16	2.27	
	.87	2.53	2.06	1.67	

TABLE C-2

MEANS - CONTEXT B

Q	Group I	Group II	Group III	Group IV	Total
	n = 5	n = 4	n = 4	n = 4	17
1	$\bar{x}$ = 4.20	$\bar{x}$ = 2.75	$\bar{x}$ = 7.75	$\bar{x}$ = 5.50	5.00
	s = .836	s = 2.50	s = .50	s = 3.31	2.62
	n = 6	n = 6	n = 5	n = 5	22
2	$\bar{x}$ = 6.50	$\bar{x}$ = 5.33	$\bar{x}$ = 8.00	$\bar{x}$ = 7.00	6.63
	s = 1.04	s = 1.03	s = 1.58	s = 1.00	1.46
	n = 3	n = 4	n = 5	n = 5	17
3	$\bar{x}$ = 5.00	$\bar{x}$ = 7.75	$\bar{x}$ = 9.00	$\bar{x}$ = 7.80	7.64
	s = 2.64	s = .95	s = .07	s = 1.64	1.93
	n = 4	n = 4	n = 4	n = 4	16
4	$\bar{x}$ = 5.75	$\bar{x}$ = 6.0	$\bar{x}$ = 7.75	$\bar{x}$ = 8.75	7.06
	s = 1.70	s = 2.94	s = 2.06	s = .95	2.23
	18	18	18	18	
	5.44	5.44	8.16	7.28	
	1.65	2.47	1.33	2.08	

TABLE C-3

MEANS - MEMORIZATION

Q	Group I	Group II	Group III	Group IV	Total
	n = 5	n = 4	n = 4	n = 4	17
1	$\bar{x}$ = 6.20	$\bar{x}$ = 4.75	$\bar{x}$ = 10.00	$\bar{x}$ = 9.25	7.47
	s = 2.86	s = .50	s = 2.16	s = 3.86	3.20
	n = 6	n = 6	n = 5	n = 5	22
2	$\bar{x}$ = 6.50	$\bar{x}$ = 6.33	$\bar{x}$ = 11.80	$\bar{x}$ = 12.40	8.95
	s = 1.04	s = 1.63	s = 3.70	s = 2.50	3.74
	n = 3	n = 4	n = 5	n = 5	17
3	$\bar{x}$ = 4.66	$\bar{x}$ = 10.50	$\bar{x}$ = 14.8	$\bar{x}$ = 11.40	11.00
	s = 1.50	s = 5.44	s = 1.64	s = 3.50	4.66
	n = 4	n = 4	n = 4	n = 4	16
4	$\bar{x}$ = 6.00	$\bar{x}$ = 6.00	$\bar{x}$ = 12.50	$\bar{x}$ = 14.00	9.62
	s = 3.82	s = 1.62	s = 3.00	s = 2.82	4.76
	18	18	18	18	
	5.94	6.83	12.38	11.77	
	2.46	3.50	3.07	3.35	

TABLE C-4

MEANS - IDENTIFICATION

Q	Group I	Group II	Group III	Group IV	Total
	n = 5	n = 4	n = 4	n = 4	17
1	$\bar{x}$ = 7.80	$\bar{x}$ = 8.75	$\bar{x}$ = 8.50	$\bar{x}$ = 8.00	8.23
	s = 4.54	s = 3.20	s = 1.29	s = .81	2.77
	n = 6	n = 6	n = 5	n = 5	22
2	$\bar{x}$ = 9.16	$\bar{x}$ = 8.33	$\bar{x}$ = 10.40	$\bar{x}$ = 9.20	9.22
	s = 2.78	s = 1.36	s = .89	s = 5.35	2.91
	n = 3	n = 4	n = 5	n = 5	17
3	$\bar{x}$ = 10.33	$\bar{x}$ = 10.00	$\bar{x}$ = 13.80	$\bar{x}$ = 11.60	11.64
	s = 2.30	s = 4.16	s = 3.70	s = 2.30	3.33
	n = 4	n = 4	n = 4	n = 4	16
4	$\bar{x}$ = 10.00	$\bar{x}$ = 10.44	$\bar{x}$ = 13.00	$\bar{x}$ = 13.00	10.31
	s = 1.41	s = 2.98	s = 3.36	s = 3.91	4.26
	18	18	18	18	
	9.16	8.11	11.5	10.40	
	3.01	3.14	3.20	3.82	

TABLE C-5

MEANS - APPLICATION

Q	Group I	Group II	Group III	Group IV	Total
	n = 5	n = 4	n = 4	n = 4	17
1	$\bar{x}$ = 5.40	$\bar{x}$ = 3.75	$\bar{x}$ = 8.00	$\bar{x}$ = 4.25	5.35
	s = 3.64	s = .95	s = 2.94	s = 2.50	2.99
	n = 6	n = 6	n = 5	n = 5	22
2	$\bar{x}$ = 5.00	$\bar{x}$ = 4.50	$\bar{x}$ = 10.40	$\bar{x}$ = 5.20	6.13
	s = 2.00	s = 2.88	s = 4.03	s = 3.56	3.75
	n = 3	n = 4	n = 5	n = 5	17
3	$\bar{x}$ = 5.33	$\bar{x}$ = 5.25	$\bar{x}$ = 13.4	$\bar{x}$ = 9.00	8.76
	s = 1.52	s = 1.50	s = 1.52	s = 3.60	4.07
	n = 4	n = 4	n = 4	n = 4	16
4	$\bar{x}$ = 6.25	$\bar{x}$ = 5.00	$\bar{x}$ = 14.00	$\bar{x}$ = 13.00	9.56
	s = 1.70	s = 1.41	s = 3.36	s = 7.43	5.58
	18	18	18	18	
	5.44	4.61	11.50	7.77	
	2.30	1.91	3.69	5.35	

TABLE C-6

MEANS - GENERALIZATION

Q	Group I	Group II	Group III	Group IV	Total
	n = 5	n = 4	n = 4	n = 4	17
1	$\bar{x}$ = 3.80	$\bar{x}$ = 1.75	$\bar{x}$ = 7.00	$\bar{x}$ = 5.50	4.47
	s = 1.64	s = 2.36	s = 4.96	s = 4.43	3.72
	n = 6	n = 6	n = 5	n = 5	22
2	$\bar{x}$ = 7.66	$\bar{x}$ = 5.33	$\bar{x}$ = 10.00	$\bar{x}$ = 10.80	8.27
	s = 2.94	s = 1.21	s = 3.16	s = 6.53	4.15
	n = 3	n = 4	n = 5	n = 5	17
3	$\bar{x}$ = 4.33	$\bar{x}$ = 6.75	$\bar{x}$ = 15	$\bar{x}$ = 11.20	10.05
	s = .57	s = 2.62	s = 2.73	s = 5.35	5.22
	n = 4	n = 4	n = 4	n = 4	16
4	$\bar{x}$ = 5.50	$\bar{x}$ = 4.25	$\bar{x}$ = 12.25	$\bar{x}$ = 15.50	9.37
	18	18	18	18	
	5.55	4.61	11.22	10.77	
	2.57	2.52	3.69	5.75	

TABLE C-7

MEANS - DICTIONARY

Q	Group I	Group II	Group III	Group IV
	n = 4	n = 4	n = 4	n = 4
1	$\bar{x}$ = 3.0	$\bar{x}$ = 1.50	$\bar{x}$ = 8.75	$\bar{x}$ = 5
	s = 3.08	s = 1.29	s = 6.13	s = .57
	n = 6	n = 6	n = 5	n = 5
2	$\bar{x}$ = 7.33	$\bar{x}$ = 7.66	$\bar{x}$ = 12.80	$\bar{x}$ = 6.60
	s = 3.77	s = 2.25	s = .83	s = 4.66
	n = 3	n = 4	n = 5	n = 5
3	$\bar{x}$ = 7.00	$\bar{x}$ = 11.00	$\bar{x}$ = 12.40	$\bar{x}$ = 14.75
	s = 2.64	s = 2.449	s = 1.14	s = 6.46
	n = 4	n = 4	n = 4	n = 4
4	$\bar{x}$ = 5.25	$\bar{x}$ = 1.50	$\bar{x}$ = 12.00	$\bar{x}$ = 14.75
	s = 3.20	s = 5.77	s = 2.44	s = 2.21

TABLE C-8

SUMMARY OF RAW DATA PRINCIPAL STUDY

N=72

Group	Obs	V	CO	R	CA	CB	M	I	A	G	D	Q
1	1	6	6	2	1	3	5	4	2	3	0	1
	2	2	8	0	4	4	9	15	7	6	3	1
	3	6	6	2	4	4	5	4	3	3	3	1
	4	6	6	2	3	5	3	7	11	5	1	1
	5	9	4	3	2	7	4	12	4	3	5	2
	6	9	2	9	3	7	9	8	7	7	11	2
	7	7	2	9	3	6	4	13	2	9	2	2
	8	16	6	2	4	8	11	12	6	6	10	4
	9	6	0	6	3	5	9	9	4	2	8	1
	10	22	6	8	4	6	3	10	8	4	4	4
	11	16	0	6	3	5	7	9	4	8	3	4
	12	9	0	9	4	8	7	9	4	12	12	2
	13	9	0	9	3	6	7	7	7	8	8	2
	14	14	8	2	2	2	6	9	4	4	5	3
	15	22	2	4	2	4	3	9	7	4	4	4
	16	13	6	9	3	7	5	9	7	4	10	3
	17	8	4	2	2	5	7	6	6	7	6	2
	18	10	0	0	3	6	3	13	5	5	6	3
2	19	14	6	0	2	7	7	9	6	7	13	3
	20	17	8	5	2	4	3	9	4	2	2	4
	21	18	7	5	1	3	7	2	4	4	1	4
	22	16	0	6	8	9	6	5	6	9	13	3
	23	22	0	2	3	9	4	4	7	5	2	4
	24	14	9	3	1	8	11	11	3	3	10	3
	25	7	2	9	5	0	4	10	3	0	1	1
	26	7	6	3	3	3	5	10	3	5	2	1
	27	12	6	8	1	4	7	8	7	4	5	2
	28	12	8	0	5	7	5	5	7	7	10	2
	29	9	6	5	2	5	6	8	6	6	8	2
	30	2	0	2	3	2	5	11	4	0	0	1
	31	6	0	6	2	6	5	4	5	2	3	1
	32	13	6	9	8	7	18	15	6	8	9	3
	33	11	0	1	5	5	4	9	5	4	8	2
	34	9	4	3	7	5	8	10	0	6	10	2
	35	22	8	0	8	8	10	6	5	6	1	4
	36	11	0	1	2	5	8	9	2	5	5	2

Continued

TABLE C-8

CONTINUED

N=72

Group	Obs	V	CO	R	CA	CB	M	I	A	G	D	Q
3	37	52	21	4	5	10	14	16	14	17	13	3
	38	60	61	6	1	6	10	15	15	11	9	4
	39	45	4	9	3	10	18	10	12	14	12	2
	40	31	6	7	1	8	11	9	7	11	9	1
	41	48	4	2	1	9	12	11	15	12	14	2
	42	50	1	0	1	9	14	13	14	12	14	3
	43	50	4	4	2	9	16	10	13	17	12	3
	44	36	4	2	0	8	9	11	11	6	12	1
	45	33	6	9	5	8	10	10	8	10	13	1
	46	51	6	7	5	9	17	19	15	17	11	3
	47	82	21	4	7	10	16	8	16	12	15	4
	48	30	0	5	0	8	12	7	12	8	13	1
	49	57	1	7	1	9	14	15	16	16	12	4
	50	42	0	2	1	6	11	11	10	8	13	2
	51	72	41	6	3	6	10	14	9	10	12	4
	52	51	0	1	1	8	13	11	11	12	12	3
	53	44	68	1	2	7	9	9	4	10	13	2
	54	24	2	6	0	7	7	8	5	0	0	1
4	55	62	1	0	6	10	18	17	18	17	18	4
	56	35	6	1	3	7	9	12	5	11	1	2
	57	60	1	0	3	8	14	15	2	18	14	4
	58	34	6	0	3	8	12	9	6	16	13	2
	59	18	0	8	2	6	15	9	8	12	0	1
	60	20	4	4	1	3	7	8	3	4	1	1
	61	16	0	6	1	3	7	8	3	4	1	1
	62	48	6	4	5	7	9	13	10	2	0	3
	63	79	61	5	0	8	12	12	15	13	14	4
	64	72	41	6	2	9	12	8	17	14	13	4
	65	27	4	1	0	8	12	0	0	0	5	2
	66	24	6	0	3	10	8	7	3	2	0	1
	67	57	1	7	4	9	13	11	14	11	13	3
	68	51	4	6	1	6	12	14	6	14	14	3
	69	47	61	3	0	6	16	13	5	16	9	2
	70	50	6	6	2	10	7	8	10	14	14	3
	71	46	0	6	2	6	13	12	10	11	10	2
	72	56	21	8	3	7	16	12	5	15	16	3

CA = Context A
CB = Context B
M = Memorization
I = Identification
G = Generalization
D = Dictionary
Q = Quartile within Group on Nelson-Denny Reading Test Vocabulary Section
V = Vocabulary
Co = Comprehension
R = Reading

TABLE C-9

SUMMARY RAW DATA OF VALIDATION EXPERIMENT

N=38

	OBS	CA	CB	M	I	A	G	D
Treatment I								
N = 11	1	1	9	7	6	10	10	12
	2	4	9	13	13	13	15	16
	3	1	8	15	7	1	15	8
	4	3	8	6	12	2	7	13
	5	3	7	11	10	10	14	11
	6	5	8	8	10	9	13	6
	7	4	10	13	10	13	14	15
	8	1	10	9	9	6	8	3
	9	4	8	7	8	6	9	2
	10	2	10	13	14	14	13	11
	11	0	8	7	8	10	12	11
Treatement II								
N = 8	12	2	9	9	7	15	16	16
	13	3	6	10	11	9	9	13
	14	2	8	7	10	8	6	9
	15	3	6	12	13	13	12	8
	16	4	7	10	9	15	9	10
	17	3	8	10	8	7	8	11
	18	4	8	7	10	9	8	12
	19	1	9	8	7	7	2	9
Treatment III								
N = 8	20	4	6	13	11	13	5	8
	21	3	9	5	9	4	3	0
	22	4	6	4	10	4	3	2
	23	0	5	3	4	5	2	0
	24	3	7	10	14	4	10	4
	25	5	8	2	0	3	5	0
	26	1	7	6	7	6	7	1
	27	1	8	7	9	9	5	2
Treatment IV								
N = 11	28	2	8	10	10	4	3	4
	29	3	8	12	12	11	2	3
	30	0	7	8	11	6	6	1
	31	3	7	5	4	6	6	3
	32	0	6	7	12	5	10	7
	33	0	6	3	7	6	1	8
	34	1	8	4	6	3	5	3
	35	3	9	8	10	11	14	13
	36	1	9	8	12	4	11	9
	37	2	5	9	8	3	6	4
	38	2	5	7	10	5	9	6

CA = Context A
CB = Context B
M = Memorization
I = Identification
A = Appliation
G = Generalization
D = Dictionary

APPENDIX D

RELIABILITY DATA

APPENDIX D

Table D-1
Reliability Data

Principal Study N=72

Dependent Variable	CA	CB	M	I	A	G	D
Number of Questions (Items)	10	10	20	20	20	20	20
Number of Observations	72	72	72	72	72	72	72
Mean Score	2.792	7.583	9.236	9.806	7.33	8.042	7.899
Variance	3.829	5.007	17.704	12.159	19.521	24.548	26.635
Standard Deviation	1.957	2.238	4.208	3.487	4.418	4.955	5.161
Reliability (KR-20)	.494	.636	.800	.677	.810	.855	.833
Reliability (KR-21)	.527	.612	.757	.620	.802	.846	.864
Standard Error of Measurement	1.346	1.394	2.074	2.150	1.965	1.941	1.904
Low Score	0	0	3	0	0	0	0
High Score	8	10	18	19	18	18	18

Table D-2
Correlation Coefficients/Prob > |R| Under HO:ROH=0/N = 72

	TOT1	TOT2	TOT3	TOT4	TOT5	TOT6	TOT7	VOC	COMP	READ
TOT1	1.00000 0.00000	0.15038 0.2074	0.04369 0.7155	0.13021 0.2756	-0.00489 0.9675	0.05030 0.6748	0.05207 0.6640	-0.09933 0.4064	-0.01979 0.8689	-0.09657 0.4197
TOT2	0.15038 0.2074	1.00000 0.0000	0.57905 0.0001	0.20608 0.0824	0.55845 0.0001	0.59487 0.0001	0.63135 0.0001	0.58712 0.0001	0.61858 0.0001	0.62635 0.0001
TOT3	0.04369 0.7155	0.57905 0.0001	1.00000 0.0000	0.46780 0.0001	0.53210 0.0001	0.72919 0.0001	0.59469 0.0001	0.68679 0.0001	0.66905 0.0001	0.69849 0.0001
TOT4	0.13021 0.2756	0.20608 0.0824	0.46780 0.0001	1.00000 0.0000	0.41017 0.0003	0.52794 0.0001	0.37602 0.0011	0.43956 0.0001	0.38812 0.0008	0.41444 0.0003
TOT5	-0.00489 0.9675	0.55845 0.0001	0.53210 0.0001	0.41017 0.0003	1.00000 0.0000	0.58743 0.0001	0.55138 0.0001	0.71228 0.0001	0.62664 0.0001	0.70624 0.0001
TOT6	0.05030 0.6748	0.59487 0.0001	0.72919 0.0001	0.52794 0.0001	0.58743 0.0001	1.00000 0.0000	0.71515 0.0001	0.72053 0.0001	0.65058 0.0001	0.70924 0.0001
TOT7	0.05207 0.6640	0.63135 0.0001	0.59469 0.0001	0.37602 0.0011	0.55138 0.0001	0.71515 0.0001	1.00000 0.0000	0.63280 0.0001	0.66948 0.0001	0.68749 0.0001
VOC	-0.09933 0.4064	0.71858 0.0001	0.68679 0.0001	0.43956 0.0001	0.71228 0.0001	0.72053 0.0001	0.63280 0.0001	1.00000 0.0000	0.79528 0.0001	0.95598 0.0001
COMP	-0.01979 0.8689	0.62635 0.0001	0.66905 0.0001	0.38812 0.0008	0.62664 0.0001	0.65058 0.0001	0.66948 0.0001	0.79528 0.0001	1.00000 0.0000	0.92567 0.0001
READ	-0.09657 0.4197	0.62635 0.0001	0.69849 0.0001	0.41444 0.0003	0.70624 0.0001	0.70924 0.0001	0.68749 0.0001	0.95598 0.0001	0.92567 0.0001	1.00000 0.0000

APPENDIX E

PERMISSION LETTER

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REFERENCES

Anglin, J.M. The growth of word meaning. Cambridge, Mass.: The MIT Press, 1970.

Athey, I. Essential skills and skill hierarchies in reading, in Smith, M.S. Chairperson, Conference on studies in reading; Summaries of panel reports, National Institute of Education, 1975.

Bartlett, M.S. A note on tests of significance in multivariate analysis. Proceedings of the Cambridge Philosophical Society, 1939, 35, 180-185.

Bloom, B.S. Taxonomy of educational objectives: The classification of educational goals, handbook 1, cognitive domain, New York, McKay, 1956.

Bloom, B.S., and Broder, L.J. Problem-Solving processes of college students. Chicago: University of Chicago Press, 1950.

Boettcher, J. Meaning assignment strategies of skilled adult readers. In M.L. Kamil & A.J. Moe (Eds.), Reading research studies and applications. Clemson, S.C. Twenty-eighth Yearbook National Reading Conference, 1979.

Boettcher, J. Diagnostic Vocabulary Testing Using Specifications for Alternatives, Presentation Secondary Reading Research Group at the National Reading Conference, San Diego, California, 1980.

Bower, G.H., Clark, M.C., Lesgold, A.M., & Wingenz, D. Hierarchical retrieval schemes in recall of categorized word lists. Journal of verbal learning and verbal behavior, 1969, 8, 323-343.

Brown, A.L. Knowing when, where and how to remember: A problem in metacognition. In R. Glasser (Ed.), Advances in instructional psychology. Hillsdale, N.J.: Lawrence Erlbaum Associates, Publishers, 1979.

Brown, A. Metacognition: the development of selective attention strategies for learning from texts. In M.L. Kamil (Ed.) Directions in reading: research and instruction. Washington, D.C.: National Reading Conference, 1981.

Brown, J.I. The Nelson-Denny Reading Test. Boston: Houghton Mifflin Company, 1973.

Brown, J.I. Programmed vocabulary: The "CPD" approach (3rd. ed.). Englewood Cliffs, N.J.: Prentice-Hall, 1980.

Cattell, R.B. Abilities: Their structure, growth and actions. Boston: Houghton Mifflin, 1971.

Clark, H.H. Semantics and comprehension. The Hague, Netherlands: Mouton, 1976.

Dale, E. The future of reading. The Reading Teacher, 1969, 23(3), 212.

Dale. E. The words we know: A national inventory. San Palo, Calif.: Field Educational Publications, Inc., 1973.

Dale, E., O'Rourke, J., and Bamman, H.A. Techniques of Teaching Vocabulary, Addison, Ill.: Field Educational Publications, Inc., 1971.

Dale, E., and O'Rourke, J. The living word vocabulary, Elgin, Ill.: Field Enterprises Educational Corportion, 1979. 2nd. edition.

Dubin, R., and Taveggia, T.C. The Teaching-learning paradox. Eugene: Center for Advanced Study of Educational Administration, University of Oregon, 1968.

Durrell, D.D. Improving reading instruction. New York: Harcort Brace Jovanovich, 1966.

Eiehholz, G., and Barbe, R. An experiment in vocabulary development, Educational research bulletin. 1961, 40, 1-7; 28.

Fillmer, H.T. A generative vocabulary program for grades 4-6, the New Elementary school journal, September 1977, 78(1), pp. 53-57.

Flavell, J.H. Metacognitive development. Paper presented at the meeting of the North Atlantic Tready Organization Advancement Study Institute on Structural/Process Theories of Complex Human Behavior, Banff, Canada, June 1977.

Gage, N.L. and Giaconia, R. Teaching practices and student achievement: Causal connections. New York University Education Quarterly, 1981, 12(3), 2-9.

Gallagher, B. Vocabulary in writing for business: Six propostions for pedagogical use. Journal of basic writing, 1979, 2(3), 74-78.

Gates, A.I. A correlational study of a battery of reading diagnostic tests. Journal of educational research, February 1947, 60, 436-47.

Goodman, K. Behind the eye: What happens to reading. In Reading process and program. Urbana, Ill.: National Council of Teachers of English, 1970.

Graves, M.F., and Hammond, H.K. A validated procedure for teaching prefixes and its effect on students' ability to assign meaning to novel words. In M.L. Kamil & A.J. Moe (Eds.), Perspectives on reading research and instruction. Washington, D.C. Twenty-ninth Yearbook of the National Reading Conference, 1980.

Halliday, M.A.K., and Hasan, R. Cohesion in english. London, Longman, 1976.

Helwig, J.T. SAS introductory guide. Raleigh, N.C.: SAS Institute, 1978.

Herber, H.L. Teaching reading in content areas. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1978, pp. 132, 129-172.

Horn, J.L. Human abilities: A review of research and theory in the early 1970's. Annual review of psychology, 1976, 27, 437-485.

Johnson, K.R., and Ruskin, R.S. Behavioral instruction: An evaluative review. Washington, D.C. American Psychological Association, 1971.

Kulik, J.A., Kulik, C.G., and Cohen, P.A. A meta-analysis of outcome studies of Keller's personalized system of instruction. American Psychologist, 1979, 34, 307-318.

Kurth, R.J. A comparison of small group and individualized instruction in junior college remedial reading programs. Reading research studies and applications, Clemson, S.C., National Reading Conference, Inc. 1979.

Langer, J.H. Vocabulary and concept development. Journal of reading, 1967, 10, 448-56.

Larkin, J.H. Instructional implications of research on problem solving. In W.J. McKeachie (Ed.), Learning, cognition and college teaching, new directions for teaching and learning (Number 2). San Francisco, Calif.: Jossey-Bass, Inc., Publishers, 1980.

Larkin, J.H., Heller, J.T., and Greeno, J.C. Instructional implications of research on problem solving. In McKeachie, W.J., Guest ed. Learning, cognition, & college teaching, new directions for teaching and learning, San Francisco: Jossey-Bass, Inc. (Number 2), 1980.

Locke, J. An essay concerning human understanding. London: Routledge, 1690.

Marshall, N., and Glock, M.D. Comprehension of connected discourse: A study into the relationships between the structure of text and information recalled. Reading research quarterly, 1978-1979, 14, 10-57.

Miller, G.A. Psycholinguistic approaches to the study of communication. In journeys in science: Small Steps--Great Strides. Albuquerque: University of New Mexico Press, 1967.

Miller, G.A. Linguistic communication: Perspectives for research. Newark, Delaware: International Reading Association, 1973.

Myers, B.F.J. Organization in prose and memory, research with application to reading comprehension. In P.D. Pearson & J. Hanson (Eds.), Reading theory, research and practice. Clemson, S.C.: Twenty-sixth Yearbook of the National Reading Conference, 1977.

Myers, J.L. Fundamentals of experimental design. Boston: Allyn and Bacon, Inc., 1979.

Myers, M., III, and Paris, S.G. Children's metacognitive knowledge about reading. Journal of Educational Psychology, 1978, 70(5), 690.

Nacke, P.L. Skimming strategy in reading as a function of familiarity with content and redundance reduction in printed discourse. Unpublished doctoral dissertation, University of British Columbia, 1970.

National Commission on Allied Health Eucation. The future of allied health education. San Francisco: Jossey-Bass, 1980, p. 14.

Norman, D.A. What goes on in the mind of the learner. In W.J. McKeachie (Ed.), Learning, cognition, and college thinking, new directions for teaching and learning. San Francisco, Calif.: Jossey-Bass, Inc., Publishers, 1980.

O'Connor, J. English vocabulary builder 2. Boston: The Human Engineering Laboratory, 1948.

Olson, C.L. On choosing a test statistic in multivariate analysis of variance. Psychological Bulletin, 1976, 83(4), 587-601.

Olson, D.R. A review of: Toward a literate society. Proceedings of the National Academy of Education. 1975, 2, 109-178.

Olson, G.M. Applying knowledge of writing conventions in prose comprehension and composition. In W.J. McKeachie (Ed.), Learning, cognition and college thinking, new directions for teaching and learning. San Francisco: Jossey-Bass, Inc., (Number 2), 1980.

O'Rourke, J.P. Toward a science of vocabulary development. The Hague: Mouton, 1974.

Petty, W.T., Herrold, C.P., and Stoll, E. The state of knowledge about the teaching of vocabulary. Champaign, Ill.: National Council of Teachers of English, 1968.

Pillai, K.C.S. Statistical tables for tests of multivariate hypotheses. Manila: University of the Philippines Statistical Center, 1960.

Richardson, M.W., and Kudder, G.F. The calculation of test reliability coefficents based on the method of rational equivalence. Journal of Educational Psychology, 1939, 30, 681-87.

Schoenfeld, A. Can heuristics be taught? Technical report group in science and mathematics education. Berkeley: University of California, 1978.

Schramm, W. Learning from instructional television, Review of educational research, 1962, 32, 156-157.

Sharon, A. What do adults read? (Research Bulletin 72-57), Princeton, New Jersey: Educational Testing Service, December, 1972.

Shaughnessy, M. Errors and expectations. New York: Oxford University Press, 1977, 171-72.

Smith, D. The item procedure. (SAS Technical Reports S-126), Raleigh, North Carolina: SAS Institute, 1981.

Smith, F. Understanding reading: A psycholinguistic analysis of reading and learning to read. New York: Holt, Reinhart and Winston, 1971.

Snow, R.E., and Peterson, P.L. Recognizing differences in student aptitudes, in W.J. McKeachie (Ed.), New directions for teaching and learning. San Francisco, Jossey-Bass, Inc., (Number 2), 1980.

Sticht, T.G. Reading in the navy (Final report for HUMRRO). Alexandria, VA: Human Resources Research Organization, 1976.

Sticht, T.G. Comprehending reading at work. In M.A. Just & P.A. Carpenter (Eds.), Cognitive processes in comprehension. Hillsdale, N.J.: Lawrence Erlbaum and Associates, Inc., 1977.

Sticht, T.G., Fox, L.C., Hauke, R.N., and Zapf, D.W. Reading in the Navy, (Final report HumRRO-FR-WD-CA-76-14), Alexandria, Virginia: Human Resources Research Organization, 1976.

Stotsky, S. Teaching prefixes: Facts and fallacies, Language arts, 1977, Nov./Dec., 887-90.

Stotsky, S. The vocabulary of essay writing: Can it be taught? in College composition and communication. Urbana, Ill.: National Council of Teachers of English, 1980.

Thorndike, E.L. Reading as reasoning: A study of mistakes in paragraph reading, Journal of Educational Psychology, 1917, (8), 323-332.

Thorndike, R.L., and Hagen, E. Measurement and evaluation in psychology and education. New York: John Wiley & Sons, Inc., 1969.

BIOGRAPHICAL SKETCH

Eleanor Marshall Schenck was born on October 29, 1930. She attended Roosevelt High School, graduating in 1948. She attended Lake Forest College and received her Bachelor of Education degree from the University of Illinois in 1952.

From 1952 until 1956 she taught first and second grades in the Champaign County, Illinois, public schools. In 1956 her family moved to Lake County, Florida, and following the birth of two children, Eleanor taught first grade from 1958 until 1960 in Leesburg, Florida. Two more children were added to her family and she substitute taught until 1968 when she returned to teach adult basic education in the Lake County school system.

In 1970 she enrolled at the University of Florida and completed a Master of Education degree in vocational, technical and adult education, specializing in reading and linguistics for adults. While enrolled in the Master of Education program she served as a graduate assistant at Santa Fe Community College and a part time instructor in their Continuing Education Program Learning Laboratory.

She received her Master of Education degree in March of 1972 and became a half time instructor in the University of Florida English Department. She maintained her community college part time instructorship also. During this time she traveled to many community colleges

and published several papers on community college reading and English developmental programs.

In 1975 she began an active consultancy to community colleges in the area of staff development. A two-year college reading text, Reading America was published in 1978.

In 1980, Eleanor enrolled in the Doctor of Philosophy program of the College of Education at the University of Florida. Her area of specialization was instructional leadership and support, with a major in reading. On March 9, 1981, Eleanor M. Schenck received the first award of the L. V. Koos Scholarship Memorial Fund for carrying out this investigation. Since September 1981, she has been employed by Refugee Services as Coordinator of English as a Second Language for Indochinese, Cuban, and Haitian refugees.

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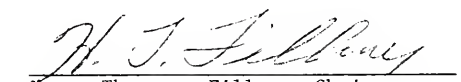

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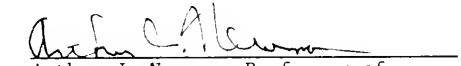

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William R. Powell, Professor of
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Albert B. Smith, III, Professor of
Instructional Leadership and Support

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James L. Wattenbarger, Professor
of Educational Administration and
Supervision

This dissertation was submitted to the Graduate Faculty of the Division of Curriculum and Instruction in the College of Education and to the Graduate Council, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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